DECEMBER, 1958

Commercial Fertilizer

and PLANT FOOD INDUSTRY

Greetings

of the Season

and Best Wishes for

a Prosperous 1959

Allied Chemical

NITROGEN DIVISION

40 Rector Street, New York 6, N. Y.

Appearance may be improved through better design, sharper color printing, reproportioning, or better choice of outside wall.

A frank discussion with us may result in a more attractive bag, reduced production costs and increased sales of your product.

When will you talk with our representative?

The Newest **KRAFTPACKER**

will handle any free-flowing material f-a-s-t-e-r, with more accuracy, than any bag filling machine of its type!

KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary
630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.
Integrated mills at St. Marys, Georgia and Gilman, Vermont

Gilman PAPER CO.
• St. Marys Kraft Corp.
• Gummed Tape Div.
• The Gilbound Corp.
• Kraft Bag Corp.

☐ We are interested in improving our bag.
☐ We are interested in your Kraftpacker.

CF

NAME OF COMPANY _____

ADDRESS _____

CITY _____ ZONE ____ STATE ____ PRINCIPAL _____

PRODUCT MFD _____

For uniformly conditioned mixed goods, use

Du Pont UAL-S

Here's how it works . . .

New Du Pont UAL-S permits you to take advantage of the well-known conditioning effect of sulfates in fertilizers. A small amount of ammonium sulfate added in a finely dispersed form as in UAL-S is equivalent to a much larger amount added dry to the mixture . . . ammonium sulfate means better, more uniform conditioning. All of your fertilizers will benefit from nitrogen derived from UAL-S, because it combines two efficient forms of nitrogen with ammonium sulfate to provide added sulfur . . . an essential plant nutrient with recognized agronomic value.

Regular mixtures cure well with UAL-S, are free-flowing and resist caking. In granular mixtures, UAL-S aids in producing good yields of hard, round, firm granules that store and distribute well. UAL-S is non-corrosive to fertilizer manufacturing equipment, including mild steel and aluminum, and it's safe—handles at moderate pressure, and there's no danger of flash fires.

Du Pont specialists can give you at-the-plant advice on proper use of UAL-S in your fertilizer mixtures. They stand ready to assist you in profitably formulating mixtures containing UAL-S. For further information on UAL-S, fill out and mail the coupon.

PROPERTIES OF UAL-S

Nitrogen Content	42.5%
Freezing Point	20°F.
Pressure	15 psi at 60°F.
Specific Gravity	1.13
Fixed to Free Ratio	.9 to 1.0

Composition: Parts 100

Urea	38.8
Ammonium Sulfate	10
Ammonia	27.1
Water	15.1
CO_2	9.0

Du Pont UAL solutions in mixed fertilizers have helped American farmers grow better crops for 25 years.

URAMON®

AMMONIA LIQUORS

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Department, Room 2539-W
Wilmington 98, Delaware

Dear Sirs: Please send me more information on UAL-S.

Name_____

Firm_____

Address_____

City_____ State_____

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Commenting Freely

by BRUCE MORAN

The big acreage "banked" in the Soil Bank lately carries a forecast, it is to be hoped, for the future. Yield per acre on "free land" has been high, because farmers have, per force, learned better land management which includes the use of more plant food. Three years of this have shown what can be done. The high yield record set in 1948 was matched in 1956-7-8 on the smallest acreage in cultivation in 40 years.

There is a big but in all this. If the features of the Agricultural Act of 1958 take hold and cling to the farm economy, will the new "freedom" of the farmer lead to doing as well as he now knows how? Or will he backslide?

That is a problem for our industry, together with all the Land Grant forces, the county agents and the dealers, to solve. Backsliding can be prevented. High plant food application can be continued. But we cannot just sit at our desks and hope.

It is a selling job that must energize every element of influence on farm thinking . . . and the time to start is now!

SOHIO's complete line of nitrogen materials gives you the full-range flexibility you need in manufacturing high-analysis finished goods. Choose from a long list of Sohiogen® Solutions, anhydrous and aqua ammonia and Sohigro® Urea to meet your exacting requirements. The "Man from Sohio" will be glad to help you with formulations . . . and explain how you can benefit from Service at Sohio. Call him soon.

A complete line of Sohio nitrogen products for fertilizer manufacture

Ammonium Nitrate — Ammonia Solutions

Sohiogen 4424, Sohiogen 4122, Sohiogen 4526, Sohiogen 4730, Sohiogen 4126, Sohiogen 4934 — Old-line and concentrated solutions for both conventional and granulation use

Urea — Ammonia Solutions

Sohiogen 2104, Sohiogen 4531, Sohiogen 4537 — Urea and ammonia in 45% nitrogen solutions, winter and summer grades, and high urea content solutions for liquid fertilizer manufacture

Urea — Ammonium Nitrate — Ammonia Solutions

Sohiogen 4119, Sohiogen 4425, Sohiogen 4428, Sohiogen 4933 — Ammonium nitrate nitrogen solutions containing 6 to 15% urea to:
1. lower salting out temperatures of solutions
2. improve granulation
3. help condition mixed goods

Urea — Ammonium Nitrate Solutions

Sohiogen 2800, Sohiogen 3200 — 28 and 32% nitrogen solutions containing no free ammonia — ideal for surface and subsurface application — as materials and in complete liquid fertilizers

Anhydrous and Aqua Ammonia

Sohigro® Urea — your choice of 45% N coated or 46% N uncoated, prilled urea supplemental source of nitrogen

. . . we're serious about SERVICE at Sohio

SOHIO CHEMICAL COMPANY

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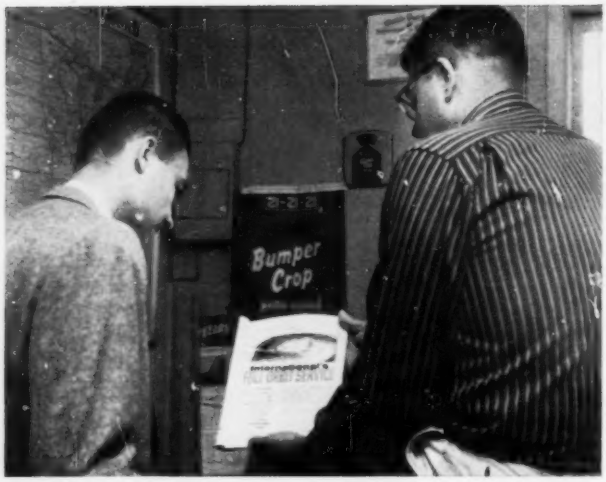


Six months ago, International introduced Full Orbit Service to the fertilizer industry. How has it worked? Here's the answer direct from one firm that is putting this new concept of service to work.

FULL ORBIT SERVICE

is helping us to analyze our merchandising program one step at a time

reports Don Peterson, General Manager, Ashkum Fertilizer Company, Ashkum, Illinois

"THE fertilizer business pays off on new ideas, and that's just the reason we're sold on International's Full Orbit Service," reports Don Peterson, General Manager of the Ashkum Fertilizer Company, Ashkum, Ill.

"For example, it has already aided in our regular program of market studies. Also, we'll hold a lot of promotional meetings this winter, and we'll be using a lot of Full Orbit meeting ideas," adds Peterson. "We've already found the book, 'Making Promotion Dollars Pay Off' comes in handy as a reference in planning next Spring's advertising program."

"In fact, every one of the Full Orbit Service books is aimed right at problems that concern us . . . and every one else in the fertilizer business. That's why the new ideas in Full Orbit Service are helping us re-evaluate our total program one step at a time."

Such remarks are typical of the comments from manufacturers who are putting Full Orbit Service to work. They, too, have learned that this new concept of service from International Minerals lays a solid foundation for step-by-step progress.

- **FULL ORBIT SERVICE** shows you how to get the market facts you need for planning a sound merchandising program . . . gives you yardsticks to measure past performance, future potential . . . and practical marketing goals for today.
- **FULL ORBIT SERVICE** helps you determine whether your selling effort needs more men for sales . . . or more sales per man. It provides ideas to use in selecting, training and supervising a hard-hitting sales staff.
- **FULL ORBIT SERVICE** outlines steps for planning meetings that arouse life, fire up salesmen and dealers . . . excite prospective customers.
- **FULL ORBIT SERVICE** provides you help in advertising and promotion — paves the way to a merchandising program that will pay off in extra sales . . . gives you the facts you'll want to know in planning a budget, selecting the right media . . . and preparing effective campaign materials.

If you have any questions about International's Full Orbit Service . . . and the way it can help you sell more fertilizer profitably . . . contact your International Minerals representative. 8-58

Creators of Living Minerals

International MINERALS CHEMICALS

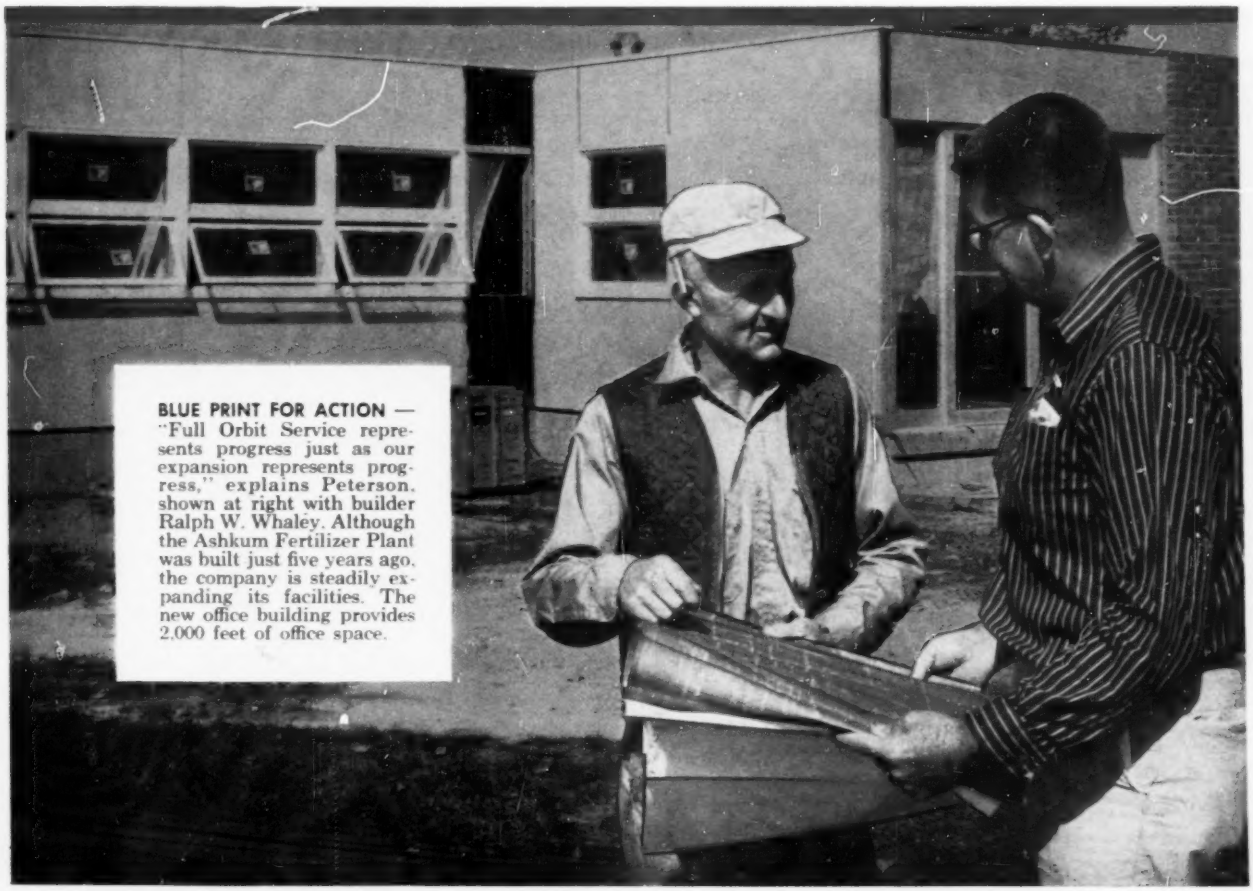
Phosphate Minerals Division • Potash Division • Phosphate Chemicals Division

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

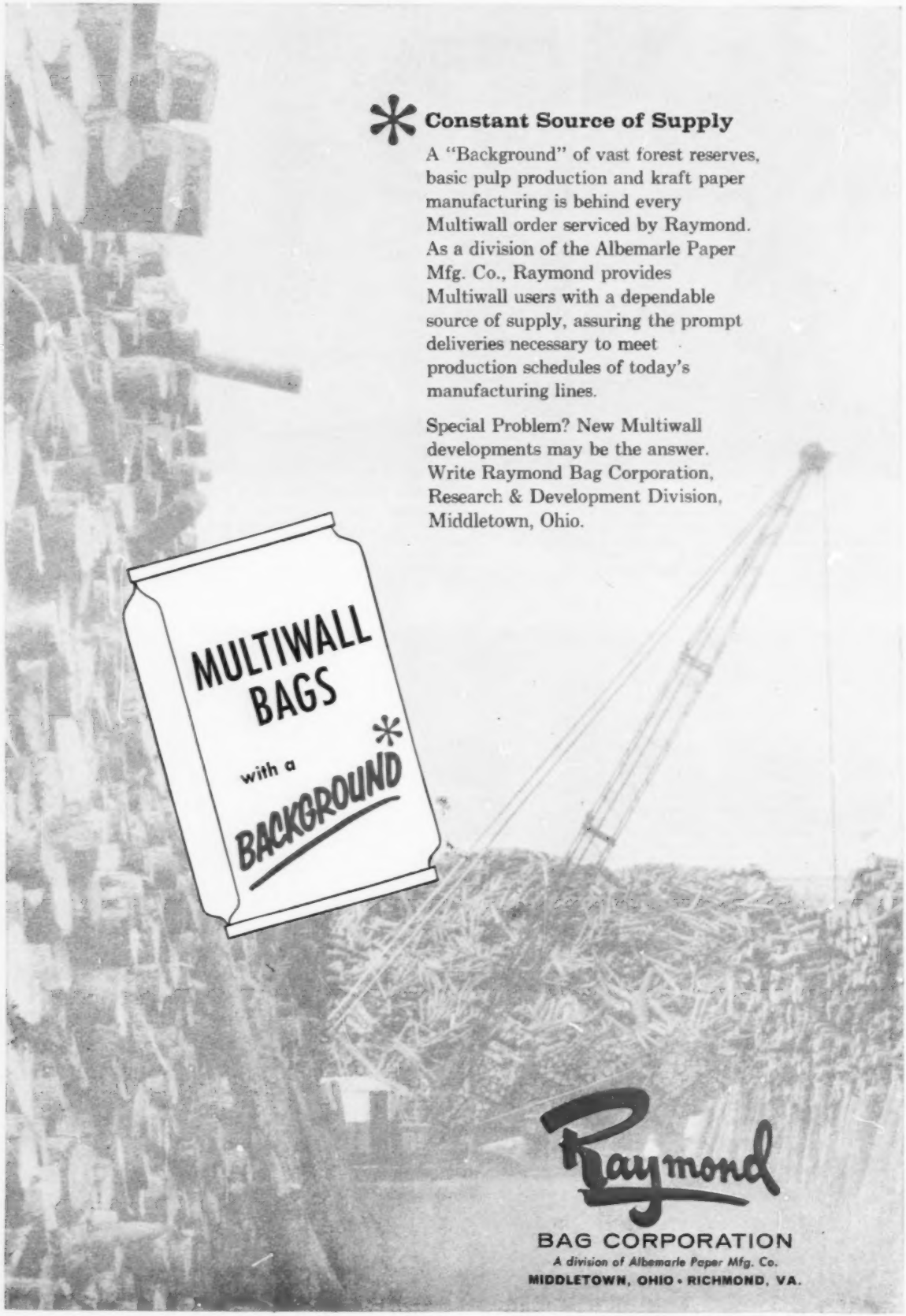
***Administrative Center* — Skokie, Illinois**

4-POINT SALES POLICY —
We've always based our sales policy on a quality product, good service, proper distribution and competitive pricing, says Sales Manager John Abbott. Full Orbit is helping us to re-evaluate and improve our sales policies in the field.

FULL ORBIT OUTLINED THE STEPS FOR US —
International Minerals program is a basic and concrete approach to manufacturing and merchandising, report Abbott (left) and General Manager Don Peterson. We believe the folks in our industry will welcome sound ideas. Surely Full Orbit will help our "Bumper Crop" program.



BLUE PRINT FOR ACTION —
"Full Orbit Service represents progress just as our expansion represents progress," explains Peterson, shown at right with builder Ralph W. Whaley. Although the Ashkum Fertilizer Plant was built just five years ago, the company is steadily expanding its facilities. The new office building provides 2,000 feet of office space.



*** Constant Source of Supply**

A "Background" of vast forest reserves, basic pulp production and kraft paper manufacturing is behind every Multiwall order serviced by Raymond. As a division of the Albemarle Paper Mfg. Co., Raymond provides Multiwall users with a dependable source of supply, assuring the prompt deliveries necessary to meet production schedules of today's manufacturing lines.

Special Problem? New Multiwall developments may be the answer. Write Raymond Bag Corporation, Research & Development Division, Middletown, Ohio.

Raymond
BAG CORPORATION
A division of Albemarle Paper Mfg. Co.
MIDDLETOWN, OHIO • RICHMOND, VA.

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TREBO-PHOS*

Cyanamid's quality triple superphosphate

1 **GRANULATION**

Trebo-Phos in typical commercial runs is producing high analysis mixed fertilizers with excellent granulation.

2 **AMMONIATION**

Ammoniation easily achieved up to 4.6% and higher with suitable equipment *without* uncomfortable ammonia fumes. Physical condition of Trebo-Phos makes possible maximum and uniform absorption of ammonia.

3 **CYANAMID SERVICE**

Cyanamid's new, ultra-modern triple plant has high storage capacity for Trebo-Phos. Inventories are maintained at levels that let Cyanamid fill your orders promptly. Cyanamid traffic experts are at your service to assure the most prompt, economical deliveries. Cyanamid technical representatives are available to help you solve production problems *in your plant*.

CYANAMID

WRITE, WIRE OR PHONE FOR FULL INFORMATION. OUR REPRESENTATIVES WILL BE GLAD TO CALL. NO OBLIGATION ON YOUR PART.

*TRADE MARK

American Cyanamid Company,
Agricultural Division,
Phosphates Department,
30 Rockefeller Plaza, New York 20, N. Y.

JUST AROUND THE CORNER

By Vernon Mount

BOOM indications are so lovely, and human nature being what it is, you can expect plenty of predictions when the usual New Year interviews get into print. Some of it is sound; some wishful thinking. We are showing a Gross National Product right now that exceeds the peak figure of the boom.

EMPLOYMENT has not gone back to normal, despite high production. Unemployment is double the "normal" though it is getting better, and will get better still once we go through the usual mid-Winter slump in payrolls. It sounds worse than it is - except, of course, to the unemployed themselves, and those who serve them.

PLANT INVESTMENT is rising. Plans shelved a year or more ago are being dusted off. Mechanization is in the forefront of much industrial thinking. This, they say, is the time to invest before the dreaded inflation sets in. And that may not be too far off - though it is not likely to be serious in 1959.

KEEP WATCHING those factors that affect your business.

Yours faithfully,

Vernon Mount

Improve rehandling operations in your plant with Blaw-Knox lever arm buckets

Blaw-Knox lever arm buckets are built to deliver low cost handling of bulk materials in fertilizer and chemical plants.

Their tight-lip construction overcomes the problem of contamination from leakage. Cast from chrome—nickel—molybdenum alloy steel they resist abrasion, insure long dependable service.

An experienced Blaw-Knox Bucket Engineer will be glad to help you select and apply the proper two, three or four line lever arm bucket.

BLAW-KNOX COMPANY
Blaw-Knox Equipment Division
Pittsburgh 38, Pennsylvania

BLAW-KNOX

WRITE TODAY for a copy of bulletin 2378-R-1. In it you will find many helpful suggestions for improving your rehandling operations.

36 plants...for prompt delivery of AA quality products

36 plants of the A.A.C. Co., located in the United States, Cuba and Canada, with main office in New York, assure you dependable, fast deliveries of AA quality products for farm and industry. You can schedule your production with confidence . . . the right quantity and grade will be at your plant when you need it.

for uniform quality, prompt delivery and technical service . . . order from

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American Agricultural Chemical
Company

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Florida Pebble Phosphate Rock • Superphosphate
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All grades of Complete Fertilizers • Keystone® Gelatin
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Sulphuric Acid • Phosphoric Acid and Phosphates
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Drilling blast holes with a multiple mounted drill in the Duval mines near Carlsbad, New Mexico. One of the many processes which bring you . . .

High Grade Muriate of Potash...

HIGH ANALYSIS • DEPENDABLE SUPPLY • UNSURPASSED SERVICE

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ST. LOUIS, DECEMBER 1, 1958–

Monsanto introduces the first truly non-caking ammonium nitrate fertilizer LION E-2

Now, for the first time since the development of solid prilled ammonium nitrate fertilizer, you and dealers everywhere may offer customers an ammonium nitrate that ends complaints and costly returns due to caking. It's Monsanto's new LION E-2 ammonium nitrate.

Developed and tested under all extremes of storage conditions by Monsanto farm researchers, amazing LION E-2 surpassed all expectations for non-caking, non-powdering performance. There is nothing like it on the market for dependable, trouble-free storage. It means easier handling for both the dealer and the farmer.

New LION E-2 ammonium nitrate is available this month. It is an exclusive, premium quality ammonium nitrate fertilizer, yet LION E-2 will cost no more than ordinary ammonium nitrate fertilizers.

This combination of premium product performance at ordinary ammonium nitrate prices will make LION E-2 the most wanted ammonium nitrate in America. LION E-2 provides the same sales advantage as offering a high octane, additive-packed gasoline for the price of "regular."

For more information contact Monsanto at once. Write, wire or call:

MONSANTO CHEMICAL COMPANY • Inorganic Chemicals Division • St. Louis 24, Missouri

THE MAN WITH THE ★ MULTIWALL PLAN

UNION
PACKAGING SPECIALIST
GENE CARTLEDGE

helps Multiwall user reduce bag costs $4.05 per M

In Multiwall packaging, paradoxically, it's sometimes necessary to add in order to reduce. Take the case of one leading company whose bag designs recently were analyzed by Union Packaging Specialist Gene Cartledge.

The firm uses Sewn Open Mouth Multiwalls in part of its operation. Cartledge recommended adding Union's special SEW STRONG construction (reinforcing strips at top and bottom of bag). The stronger closure enabled the basis weight of each bag to be reduced by 10#. The new sewing method led to a reduction in bag length, an improved bag design—and $4.05 per M savings! Another recommendation: convert all the firm's present Sewn Valve Multiwalls to Sewn Open Mouth types. This complete changeover will further streamline bagging and, based on the company's annual requirements, result in thousands of dollars in additional savings.

Union Multiwall Recommendations are based on this 5-Star Packaging Efficiency Plan

- DESIGN
- EQUIPMENT
- CONSTRUCTION
- SPECIFICATION CONTROL
- PLANT SURVEY

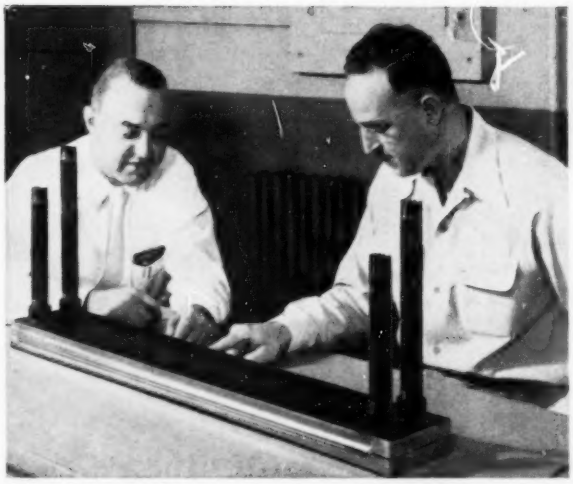
Every day, Union's 5-Star Packaging Efficiency Plan is helping packers like yourself get more for their Multiwall investment. Yet it costs nothing to put it into action. Write today for complete details.

Better Multiwall performance through better planning

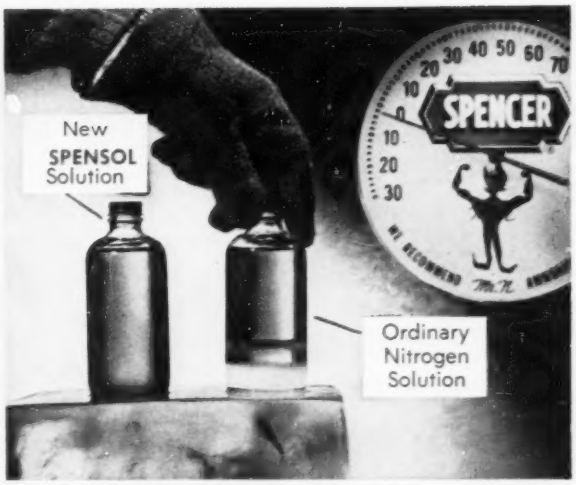
union camp ★

UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

UNION MULTIWALL BAGS
UNION BAG-CAMP PAPER CORPORATION
233 BROADWAY, NEW YORK 7, N. Y.



New Spencer Sparger aimed at reducing corrosion problems offers a unique idea in design concept. Slits the length of the sparger release liquid evenly to achieve better distribution. Holes have been eliminated, and fabrication simplified.



At -2° F. SPENSOL 440 stays clear. Ordinary solution at right has salted-out material in bottom of bottle and in solution. (SPENSOL 440 (22-66-6) salts out at -17° F. SPENSOL 430 (20-68-6) salts out at 14° F.)

Spencer Chemical Company Announces . . .

New Money-Saving Products For Fertilizer Manufacturers:

1. Now! A newly-developed sparger that provides better diffusion of liquid!

2. Now! SPENSOL® GREEEN™ Solutions that save you up to $1.97 per ton!

Good news for mixers is coming steadily from Spencer Chemical Company. Latest development is a completely new kind of sparger, built without pipes or holes, which aids distribution and reduces corrosion.

The Spencer Sparger releases solution through continuous slits on the sides for more efficient diffusion of liquid in the mixture. Quality of material is improved, ammonia loss is greatly reduced.

You'll find that this new sparger can give you more on-grade material, ton after ton, as well as reducing air pollution in severe cases!

Machined from bar steel, the Spencer Sparger has no light-weight fragile surfaces that need frequent maintenance or costly replacement.

Two New Solutions

Another recent development by Spencer Chemical Company is a pair of nitrogen solutions that can cut costs for mixers as much as $1.97 per ton! Here's how:

SPENSOL 430 and SPENSOL 440 have a higher percentage of total nitrogen as fixed nitrogen, so you use less sulfuric acid in formulating your product.

In making 12-12-12, you cut sulfuric acid use as much as 123 lbs. per ton of 12-12-12. At a delivered cost of $27.00 a ton of sulfuric acid, you save $1.66.

This also lets you get as much as 1.3 more units of P_2O_5 from normal superphosphate, which costs about 24¢ less per unit than triple superphosphate. This makes an additional saving of 31¢, or a total saving of $1.97 per ton!

Contain Less Water

Both solutions contain only 6% water, so you pay less freight, need less drying and less recycle. And for grades with low nitrogen ratio, you can use more low-cost anhydrous.

For more information on SPENSOL 430 or 440, or the new Spencer Sparger, write, wire or phone Spencer Chemical Company at the sales office nearest you.

SPENCER®

America's Growing Name in Chemicals

SPENCER CHEMICAL CO., Dwight Bldg., Kansas City 5, Mo.; District Sales Offices: Atlanta, Ga.; Chicago, Ill.; Memphis, Tenn.; Kansas City, Mo.; Works, Pittsburg, Kans.; Chicago, Ill.; Henderson, Ky.; Vicksburg, Miss.; Orange, Texas.

Insist on SPENSOL GREEEN (Spensol Nitrogen Solutions)

NOW...ONE MIDWESTERN SOURCE FOR THREE BASIC FERTILIZER MATERIALS

With the addition of a phosphatic solution plant to its chemical complex at Tuscola, Illinois, U.S.I. can now supply a large area in the Midwest with a variety of fertilizer materials that will meet all your needs for these components:

PHOSPHORUS . . . in the form of Phosphatic Fertilizer Solution (wet process phosphoric acid, 54-55% P_2O_5). This is available from U.S.I.'s new plant which produces 30,000 tons/year of P_2O_5. This chemical frequently enables you to make your regular and special granular grades of fertilizer at lower cost . . . and to make higher analysis grades.

NITROGEN . . . available as anhydrous or aqua ammonia, plus 16 types of nitrogen solutions including urea types.

SULFURIC ACID . . . available in all concentrations including oleum, plus good spent acid of fertilizer quality. Plants, not only in Tuscola, but also in Sunflower, Kansas, and Dubuque, Iowa.

To help you make the most of these various products, U.S.I. Technical Service people are ready to work with you. The U.S.I. Engineer will help you trouble shoot, set up formulations, work with you on experimental runs, consult with you on equipment selection, and can also offer U.S.I.'s laboratory facilities for more intensive investigations.

For products or assistance from U.S.I. Technical Service Department, write Heavy Chemicals Sales.

U.S.I. INDUSTRIAL CHEMICALS CO.
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99 Park Ave., New York 16, N. Y.
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FROM

Receiving raw materials

TO

Shipping finished product

it's I & C

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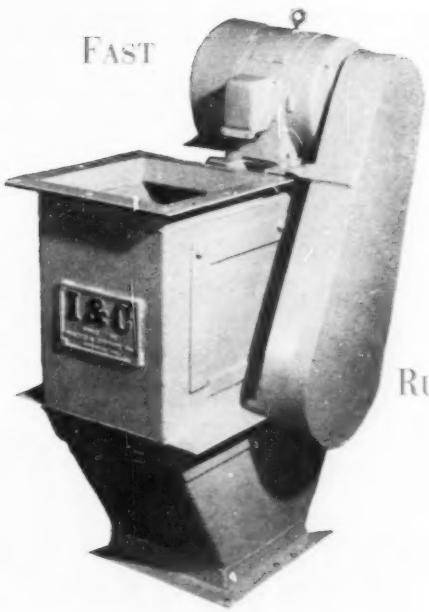

EFFECTIVE

RUGGED

Shown above is the ROTARY PULVERIZER recently added to the I & C line of quality equipment for the fertilizer industry. Available in both CHAIN FLAIL and SLING BAR types it combines a proven principle with quality workmanship to provide you with still another product on which I & C CAN SAVE YOU MONEY.

For details write or call

INGLETT & COMPANY, INC.

P. O. Box 3425 REgent 6-9795 Augusta, Ga.

3

ROP

GRANULAR

COARSE

ONE SOURCE FOR ALL THREE

ROP, Granular and Coarse.

TRIPLE SUPERPHOSPHATE

Quality controlled ROP, Granular and Coarse Triple Superphosphate of highest uniform consistency, properly conditioned, ready on arrival for immediate processing.

PLUS-

PHOSPHORIC ACID

Manufactured to the following specifications

52-54 P_2O_5
Solids less than 1% by Weight
Specific Gravity (60° F) 1.68-1.73

Available In Rubber Lined Tank Cars
Technical Service Available At Your Request

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Area Offices
Atlanta, Georgia St. Louis, Missouri Norfolk, Virginia

From The Country's Largest And Most Dependable Source Of Phosphate Products For High Analysis Formulation

U.S. PHOSPHORIC PRODUCTS

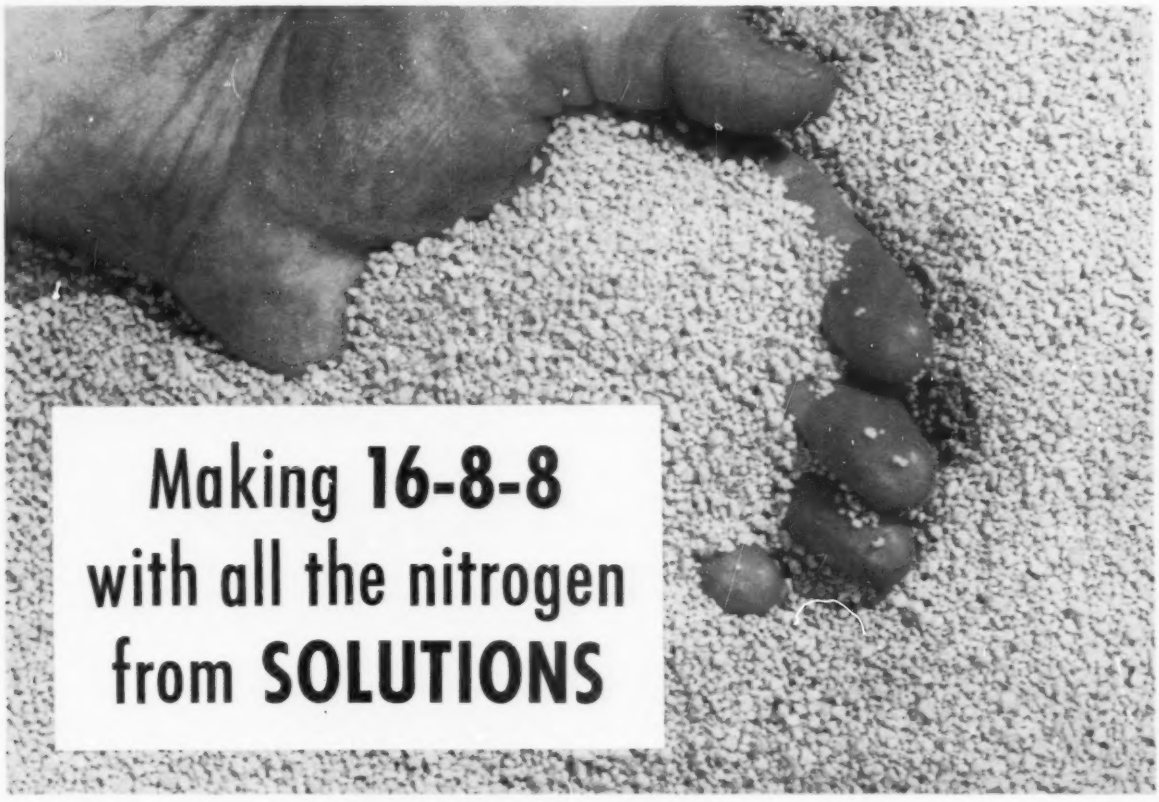
TAMPA, FLORIDA

Division

TENNESSEE TC CORPORATION

Arcadian® News

Volume 3 | For Manufacturers of Mixed Fertilizers | Number 12



Making 16-8-8 with all the nitrogen from SOLUTIONS

The **16-8-8** granular fertilizer, illustrated above, was produced by a new and different technique of progressive ammoniation, with *all* the nitrogen in the fertilizer derived from ARCADIAN® Nitrogen Solutions.

Perfected by Nitrogen Division technical men, this new process involves the use of sulfuric acid with certain specified Nitrogen Solutions and no other nitrogen carrier.

Because all the nitrogen is obtained from Solutions, the cost of nitrogen is greatly reduced and there is room in the high-analysis mixture for normal superphosphate and other desirable ingredients.

Operation of the process requires certain modifications in standard ammoniating equipment, however the extra equipment cost is an excellent investment in view of the many advantages obtained. The re-cycle rate is low and permits full utilization of equipment with maximum output.

By this new method of ammoniation, air pollution is minimized and there is almost no loss of plant food. The 16-8-8, illustrated above, was formulated at 16.16-8.08-8.08. The end result of the process is a homogeneous product easily dried to 0.3% to 0.5% water. The extremely low moisture content helps the fertilizer to hold its quality over a long period.

This method is a major advance in the technique of manufacturing better fertilizers at lower cost. It will pay you to get all the facts on its simple operation and its many advantages. Contact: Nitrogen Division, Allied Chemical, 40 Rector Street, New York 6, N. Y.

For BIGGER Profits Put More N in N-P-K

It Pays to Make and Sell High-Nitrogen Fertilizers

Fertilizer manufacturers are faced with a golden opportunity to increase profits and expand markets by putting more nitrogen in mixed fertilizers.

Most of the leading fertilizer-consuming crops need more nitrogen than any other plant food. Corn, wheat and cotton require more than twice as much nitrogen as phosphoric acid, and far more nitrogen than potash. Many other crops are big users of nitrogen.

Yet the average mixed fertilizer contains less nitrogen than phosphoric acid and potash. To get the yields they want, farmers make up the difference with extra applications of straight nitrogen materials.

Trend to Straight Nitrogen

More nitrogen is sold as straight materials than in mixed fertilizers, and the use of nitrogen as straight materials is gaining faster than the use of nitrogen in mixed fertilizers.

Of course, it is not practical to supply all the nitrogen needs of some crops on some soils with mixed fertilizers. But, for most crops on most soils, it is practical, efficient, economical and profitable to supply more nitrogen in mixed fertilizers.

New Production Techniques

Today you are in a better position than ever before to take full advantage of this situation. The development of new ammoniation techniques enables you to greatly increase the nitrogen content of mixed fertilizers, with all the nitrogen derived from low-cost ARCADIAN® Nitrogen Solutions. Production of high-analysis, high-nitrogen mixed fertilizers is easier than ever before.

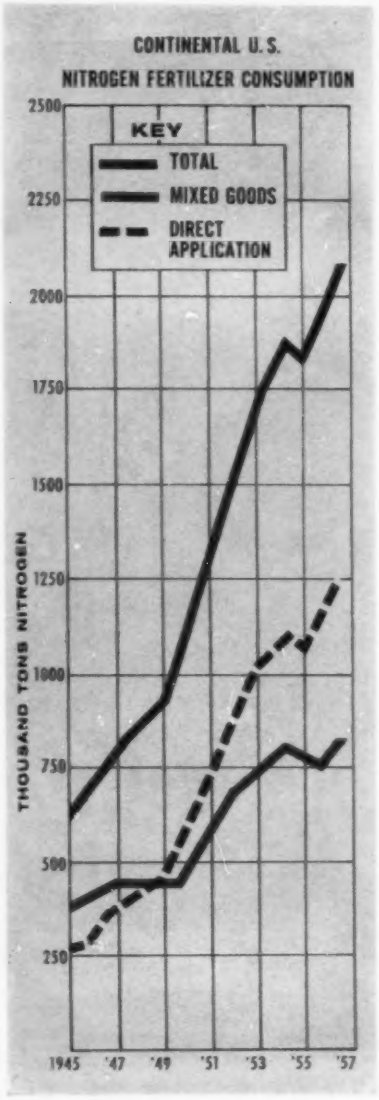
Bigger Dollar Volume

When you balance your fertilizer with adequate nitrogen to meet crop requirements, you also help to insure the best possible return from the phosphorus and potash in your fertilizer. Research has proved that sufficient available nitrogen increases a plant's efficient use of phosphorus and potash.

By producing high-analysis, high-nitrogen mixed fertilizers, you can put a bigger dollar volume of tonnage through your plant. You can also save money in storage and shipping costs per unit of plant food. These costs are becoming more important, with increasing freight rates and the necessity to warehouse more tonnage in late seasons.

Helps Your Dealer

With high-nitrogen fertilizers, you increase the farmer's profit, your profit and your dealer's profit. Your dealer can make better use of his storage and trucking facilities. He has less storage cost per dollar of inventory and he hauls a higher value pay load. Most important of all, he can supply his farmer customer with his complete plant food requirements in a one-sale, one-package deal. This builds exclusive customers and minimizes the danger of losing business to a competitor.



PLANT FOOD USE COMPARED TO CROP NEEDS

Crop	Acreage Fertilized	Average Pounds Used Per Acre*			Pounds Needed Per Acre For Good Yield			
		N	P	K	N	P	K	
Corn	60%	27	28	25	160	60	120	100 bu.
Cotton	58%	49	31	25	105	45	65	750 lbs.
Wheat	28%	18	27	19	70	30	50	40 bu.
Oats	30%	17	28	20	75	35	95	80 bu.

*On acres receiving fertilizer.

Ask Nitrogen Division

It will pay you to start now to make and sell more high-nitrogen mixed fertilizers. Get all the facts on the new and different production techniques that enable you to produce high-nitrogen mixed fertilizers with all the nitrogen derived from low-cost ARCADIAN Nitrogen Solutions. Contact: Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

Cold Weather Handling of Nitrogen Solutions

Nitrogen Solutions with a high content of ammonium nitrate or urea salts are an economical source of nitrogen for production of high-nitrogen mixed fertilizers. But, certain precautions are required in handling these Solutions during cold weather, due to their tendency to "salt out."

Because of the high level of dissolved salts in these Solutions, their "salting-out" temperature is higher than that of Solutions containing more free ammonia or water. It is also higher than atmospheric temperatures during winter months in some areas.

The "salting-out" temperatures for all ARCADIAN® Nitrogen Solutions are shown in the specification chart on the following page.

These are the Solutions' temperatures at which crystals begin to form. Crystallization of nitrogen salts does not start until the temperature of the Solution actually reaches the "salting-out" or "saturation" point.

Accurate Laboratory Tests

The exact "salting-out" point of each Solution is determined in the Nitrogen Division laboratory by gradually cooling the Solution until crystals start to form. "Salted-out" samples are then warmed and dissolution points of crystals are checked against previously-determined "salting-out" temperatures, to avoid any possibility of inaccuracy due to super cooling.

Nitrogen Division technicians chill the Solution until crystals occupy much of the visible Solution space. The Solution is then warmed and its temperature at the disappearance of the last crystal is determined. The test is then repeated with very slow warming as the indicated dissolution temperature is approached.

When the "salting-out" temperature is obtained by this method, there is no possibility of salt deposition above this temperature. Slightly below this temperature, only incipient crystal formation is possible. Crystallization increases progressively as the temperature is lowered further and only at much lower temperatures will the Solution freeze solid.

Temperatures Change Slowly

Solution temperatures actually respond very slowly to changes in atmospheric temperature. Tank-car quantities of Solution must be exposed to low atmospheric temperatures for considerable periods of time before the Solution temperature will drop to atmospheric temperature.

The amount of solids that crystallize are in proportion to the temperature drop below the saturation point, and crystals dropping out of solution lower the "salting-out" point of the remaining liquid.

Openings in spray pipes and lines in the fertilizer plant are usually of sufficient size to enable Solutions carrying small amounts of crystals to flow without difficulty.

The table below shows the amount of salt which will separate from two NITRANA® Solutions at various temperatures below the "salting-out" point.

In practice, Solutions are often successfully handled and tank cars are completely unloaded, when atmospheric temperatures are considerably below "salting-out" temperatures. In such cases, it is important to avoid allowing Solutions to remain stagnant in pipe lines and equipment for a prolonged period. If there is to be a delay in operation, the system should be purged immediately.

APPROXIMATE POUNDS OF SOLID SALT FROM 100 POUNDS SOLUTION WHEN COOLED BELOW THE SOLUTION "SALTING-OUT" TEMPERATURE

SOLUTION	SALTING OUT TEMPERATURE	DEGREES BELOW "SALTING-OUT" POINT 5°F	10°F	15°F	20°F
NITRANA 4	56°F	2 lbs.	6 lbs.	8 lbs.	10 lbs.
NITRANA 4M	61°F	2 lbs.	5 lbs.	7 lbs.	9 lbs.

Ten Helpful Suggestions

The following suggestions will assist you in more efficient handling of NITRANA®, URANA®, and U-A-S® Solutions during cold weather:

1. Use shortest feed lines practicable. Eliminate unnecessary bends and constrictions. Install enough union-connections for convenient dismantling of lines for cleaning. Install tees or crosses instead of ells at bends to permit cleaning with rods or stiff wires. The branches of tees should be upward. There should be no sags or dips in the line.

2. Use only diaphragm-type valves.

3. When supply pipes are cold, do not introduce solution until mixing machinery has been started and the first charge of superphosphate is actually in the mixer. Then try to keep solution moving with a minimum of delay between charges. If for any reason delay is anticipated, blow the solution out of the measuring tank and out of pipe lines. Equipment should be arranged for blowing the solution back into the tank car or the storage tank.

4. When atmospheric temperatures are expected to be below "salting-out" point, do not transfer solution to storage tanks but use directly from tank car. Ammoniating Solutions are loaded hot and Nitrogen Division tank cars are well insulated.

5. Unless necessary, do not vent air from tank car until unloading is completed, since this is a cooling action.

6. After mixing operations have stopped and lines are cleared of solution, disconnect feed lines at tank car. This will avoid the filling of the piping through any leak in the shut-off valve.

7. Equip solution lines with water connection for cleaning. If warm water is available, use this for cleaning and also to warm up feed lines and tank car valves before introducing solution. Completely plugged lines should be opened sufficiently by rodding to permit some water to be forced through in order to speed solution of the salt.

8. It is advisable to have gauge glasses and connections of at least ¾-inch size.

9. Keep gauge glasses and gauge glass connections warm with electric heating devices or with electric lights. Infra lamps prove quite effective.

10. Insulate pipe lines wherever practical. Use the best insulation obtainable—but even dry burlap is better than no insulation.

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When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60° F	Approx. Vap. Press. at 104° F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.9	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6	42.0	19.5	66.3	6.0	8.2	9.3	1.178	10	34
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
15	44.0	28.0	40.0	15.0	17.0	12.7	1.052	29	1
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	-108

Other ARCADIAN® Products: N-dure® • UREA 45 • A-N-L® Nitrogen Fertilizer
Ammonium Nitrate • American Nitrate of Soda • Sulphate of Ammonia

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an up-to-the minute review

Potash in Liquid Fertilizer Manufacture

by Edwin C. Kapusta
United States Potash Company
Division U. S. Borax & Chemical Corp.

Some of the more important properties of a source of potash for use in the manufacture of liquid fertilizers are: **(1)** Solubility; **(2)** Purity —minimum of insoluble impurities; **(3)** Compatibility with other materials used in the process; **(4)** Readily available and reliable source of supply; **(5)** Ease of storage and handling; and most important, **(6)** Low cost per unit of plant food.

There are available, of course, a large number of potassium chemicals which meet one or more of these qualifications, to some degree. Some of these more common, to name a few, are potassium carbonate, potassium sulfate, potassium nitrate, potassium phosphates, potassium hydroxide and potassium chloride or muriate of potash as it is commonly called. Of this group, potassium chloride has generally proven to be the most popular for this application. It is sufficiently soluble and compatible with other ingredients under most conditions. It is readily available in a sufficiently pure form which may be easily and safely handled and stored in the plant with the use of conventional materials handling equipment. Most important, it is the least expensive form of fertilizer potash available, since it is the basic raw material source of potassium for the manufacture of other potassium chemicals.

Types of Potassium Chloride

Muriate of potash is available in technical and agricultural grades, which vary in chemical composition, physical properties, and price.

The highest purity muriate of potash is sold as chemical or technical potassium chloride. Because of its extreme purity (99.9% KCl) and the operations involved in obtaining this high degree of purity, it commands a premium price over agricultural muriates. The largest portion of chemical grade potassium chloride is used in electrolytic processes in the production of caustic potash. For this use, it must be extremely pure and devoid of conditioning agents which may be harmful to the process operation or products produced. Since potassium chloride for this use cannot be conditioned to guard against caking, it can, under certain conditions of temperature and humidity, cake during transport and storage. Caking may lead to difficulties in car unloading and handling in the fertilizer plant, adding to labor and expense in plant operation. For these reasons, untreated chemical grade potassium chloride is not widely used in liquid fertilizer manufacture.

Agricultural muriates of potash may also differ in regard to chemical analysis and physical form, depending principally on the method used in winning the potash from the ore and the method of processing the potassium chloride into its finished form. As you know, the major portion of our domestic muriate of potash is mined near Carlsbad, New Mexico. The raw ore which is mined is essentially a physical mixture of sodium and potassium chlorides and the problem resolves itself into separating the potash from the salt. Fortunately, these two constituents (sodium and potassium chloride) have sufficiently different properties which may be used as a basis of their separation. Differences in specific gravities of sodium chloride and potassium chloride permit a separation of these components by floatation processes. Products from these processes contain about 95% KCl and are generally red in color reflecting the presence of insoluble impurities which make such materials unsuitable for use in liquid fertilizers. Differences in solubility characteristics of sodium and potassium chlorides allow for a separation by solution and recrystallization mechanisms. A recrystallized agricultural muriate of potash is available which is white in color and contains about 99% KCl or 62/63% K_2O. The absence of insoluble impurities, removed during the recrystallization process, makes this material ideally suitable for use in liquid mixtures. It is especially treated to render it non-caking and free-flowing during shipment and storage. Recrystallized agricultural muriate of potash is available in two general particle size ranges; a so-called standard or finely divided muriate, and a granular or coarser particle size material. Because rate of solution increases with decreasing particle size, the finely divided or standard form is generally preferred for use in liquid fertilizer manufacture. It should be noted that the granular or coarse materials command a slight premium in price over the standard size muriates.

Shipping and Handling

Agricultural muriate of potash is shipped in bulk and bagged forms.

Bulk shipments are made in 40 ton minimum box or hopper bottom cars. Bagged shipments are packaged in 100 pound kraft paper bags. The form of shipment will, of course, vary with the facilities available for unloading and storage at the fertilizer plant. Plants with facilities for bulk storage can realize economies by eliminating the additional costs incurred in bagging muriate of potash. In the event of bulk storage, the material should be stored in a readily accessible, dry, clean area free from possible sources of contamination. Properly conditioned agricultural muriate of potash will remain free-flowing and non-caking even after prolonged storage in bulk or bagged forms. Bagged muriate of potash is, of course, less susceptible to contamination than bulk material.

Bulk muriate of potash is easily handled by conventional materials handling equipment. It is usually unloaded and transported in the plant by means of tractor shovels. It may be weighed batchwise on ordinary platform scales or continuously by gravimetric feeders. Delivery to the mixing tank is usually

Dr. Kapusta's paper was presented to the Pacific Northwest Plant Food Association meeting October 23.

accomplished by means of conveyor belts. In some cases the desired quantity of muriate is delivered to the mixer by means of an augur type screw conveyor. Muriate of potash poses no particular problems in regard to storage or handling; and presents no safety hazards to plant personnel.

Use in Liquid Fertilizers

In normal practice in the acid neutralization process for making liquid fertilizers, the usual order of addition of components in the manufacture of liquid mixed fertilizers is **(a)** water **(b)** phosphoric acid, **(c)** source of nitrogen—anhydrous, aqua, or nitrogen solutions, **(d)** potassium chloride and supplemental sources of solid nitrogen—urea or ammonium nitrate.

Potassium chloride has a negative heat of solution; that is, it absorbs heat when it is dissolved in water, causing the temperature of solution to drop below that of the original solution. In a pilot plant test of the manufacture of a 6-18-6, the neutralization of acid with ammonia resulted in a boiling solution of ammonium phosphates. The addition of the desired quantity of muriate of potash reduced the temperature of the solution to approximately 160°F. This illustrates the cooling effect noted when potassium chloride is added to the ammonium phosphate solution. Solid ammonium nitrate or urea added to provide supplemental nitrogen in liquid fertilizers also produces a cooling effect since both materials absorb heat on solution in water. Urea absorbs slightly more heat per unit of plant food than potash. On the same basis, ammonium nitrate absorbs about twice as much heat as potassium chloride. If these materials are supplied in solution form, the only effect they have on temperature of the liquid fertilizer is that of cooling by dilution.

The inclusion of muriate of potash has little effect on the pH of the fertilizer solution, but does increase the density of the liquid mixture. An 8-24-0 has a pH of 6.6 and a density of 10.5 pounds per gallon at 60°F. A 6-18-6 has a pH of 6.6 and density of 10.6 pounds per gallon.

Plant food content is one of the most important considerations in the manufacture of mixed fertilizers, either liquid or solid. The advantages of high plant food content, or analysis, are quite obvious. In the production of liquid mixtures, plant food content is limited by the solubility of the materials used to make the mixture.

Since solubility varies with temperature, liquid fertilizers should be formulated to preclude crystallization or salting out of solid components at the lowest temperature which might be encountered during the storage and/or handling of the liquid mixture. Thus solubility-temperature relationships will dictate the grades and types of liquid fertilizers which may be manufactured and marketed during various seasons of the year. In some regions, depending on the season, liquid mixtures should be able to tolerate a temperature of below freezing, without salting out, to be acceptable.

"Salting out" or crystallization of solids from a solution is one of the major considerations of a liquid fertilizer manufacturer. The settling out of solids in the bottom of tank or container not only results in lowering of the analysis of the remaining solution, but presents additional problems in re-dissolving the precipitated solids. New and untried fertilizer formulations should be pretested in the laboratory since it is impossible to predict the mutual solubility of various mixtures of plant food materials.

In discussing the effect of potassium chloride inclusion on the analysis of liquid fertilizer mixtures, consideration should be given to its solubility limitations in neutral ammonium phosphate solutions and to its reaction with supplemental sources of nitrogen which may influence the salting out temperature of the liquid fertilizer.

Ammonium phosphate (8-24-0) solution made by neutralizing phosphoric acid with ammonia has a salting out temperature of approximately 20°F. The crystalline phase which salts out at this temperature is diammonium phosphate. In a 6-18-6 grade, made by the addition of postassium chloride, the solution has a salting out temperature of about 8°F; again, the crystalline phase is diammonium phosphate. A 3-9-9 made by adding muriate of potash to an ammonium phosphate solution will salt out KCl at about 5°F. In making liquid fertilizers with a nitrogen to P_2O_5 ratio greater than 1 to 3, a source of supplemental nitrogen must be employed. Solubility characteristics, availability and favorable costs generally dictate the use of ammonium nitrate or urea, or combinations of the two, as principal sources of supplemental nitrogen for use in liquid fertilizers.

Table I.—Effect of Source of Supplemental Nitrogen on Salting Out Temperatures of Liquid Fertilizer

Grade	Source of Supplemental Nitrogen*		Saturation Temperature, °F
	Urea	Ammonium Nitrate	
16-4-4	—	100	35
	100	—	27
	87	13	12
12-6-6	—	100	63
	100	—	—2
	90	10	—5
10-5-5	—	100	53
	100	—	2
	84	16	0
9-9-9	84	16	80
	100	—	25
8-16-8	0	100	68
	100	—	43
	50	50	32
5-10-10	0	100	38
	100	—	33
	23	77	25

* Per cent of total supplemental nitrogen added.

Table II.—Salting Out Temperatures, Nitrogen-Potash Liquid Fertilizers Made with Muriate of Potash

	Ratio	Source of Nitrogen		
		Urea	Ammonium Nitrate	32% N Solution*
Salting Out Temp. 32°F.	2-0-1	17-0-8.5	10.5-0-5.25	10-0-5
	1-0-1	11-0-11	6.25-0-6.25	7-07
	1-0-2	6-0-12	4-0-8	5.5-0-11
	1-0-4	3.25-0-13	2.5-0-10	3.5-0-14
Salting Out Temp. 50°F.	2-0-1	19-0-9.5	13.5-0-6.75	14-0-7
	1-0-1	11.75-0-11.75	8-0-8	9-0-9
	1-0-2	6.5-0-13.0	5-0-10	7-0-14
	1-0-4	3.5-0-14.0	3.25-0-13	3.75-0-15

* 16% N from urea, 16% N from ammonium nitrate.

These materials may be used as solids or in solution form. Urea is generally the more preferable material. It has a high solubility and does not react with other ingredients of the mixture, including potassium chloride, to give less soluble products. Ammonium nitrate, although also highly soluble, reacts with potassium chloride to form potassium nitrate which has a relatively low solubility.

The use of urea in three-component mixed fertilizers will generally permit the production of grades containing several units more of plant food than the use of ammonium nitrate in grades of comparable ratios. Studies of saturation temperatures, the lowest temperature at which the fertilizer solution will contain no solids under any conditions, of various mixtures made with varying quantities of urea and ammonium nitrate supplying the supplemental nitrogen, have indicated that specific mixtures of ammonium nitrate and urea have in some cases provided lower salting out temperatures than the use of either ammonium nitrate or urea as the sole source of supplemental nitrogen[1]. Some examples of this phenomenon are given in Table I.

The data in Table I illustrate the importance of the nitrogen source in considering the compatibility of potassium chloride in three component liquid mixtures. In most cases, urea, alone or in combination with ammonium nitrate, will prove to be more desirable than use of ammonium nitrate as the sole source of supplementary nitrogen. In general, the potash content of liquid fertilizers is usually restricted to about 10 units of K_2O when derived from muriate of potash.

Nitrogen source is likewise a most important consideration in the manufacture of nitrogen-potash mixtures made with potassium chloride as the source of potash. The effect is similar to that noted above; the use of urea permits the manufacture of higher analysis mixtures than ammonium nitrate. Salting out temperatures are given in Table II for various nitrogen-potash liquids[2]. The data are expressed in terms of the highest grades (for various ratios) which can be made with various nitrogen sources without salting out at 32°F and 50°F. In producing liquid N-K mixtures with potassium chloride as the source of potash, the use of urea as the source of nitrogen permits the production of higher analysis grades than the use of mixtures of urea and ammonium nitrate or ammonium nitrate alone.

EDWIN C. KAPUSTA

Corrosion

In the majority of liquid fertilizer plants, mild steel is used as the material of construction for all equipment with the exception of the reactor tank where raw phosphoric acid is neutralized with ammonia. The reactor vessel, or that portion of the vessel in which the neutralization is carried out, is normally constructed of stainless steel. Although little test data has been available, mild steel has proven generally satisfactory after several years of use in plant storage and application equipment.

Recent Tennessee Valley Authority investigations[3] on the corrosive effect of liquid mixed fertilizers have indicated that mild steel was either fully acceptable or very close to it under all combinations of variables tested. In these studies, a corrosion rate of less than 20 mils per year was classified as fully acceptable, a rate of 20-60 mils per year as possibly acceptable and greater than 60 mils not acceptable. Corrosion rates for 8-8-8, 10-10-10, and 12-12-0 at room temperature were in the order of 0.4-0.9 mils per year. Higher phosphorus to nitrogen ratio mixtures had higher corrosion rates; 8-24-0 had a rate of approximately 1.1-1.2 mils per year.

Although corrosion rates were very low, mild steel test specimens exposed to potash containing solutions rusted on subsequent exposure to air. A series of tests were made to determine the degree of corrosion which might result from filling and emptying tanks and from leaving tanks empty for periods of time. In these tests the specimens were alternately immersed in solution and suspended in air. After completion of the 28 day test the specimens were exposed to air for 6 months and the weight loss determined. Again, the corrosive effects in all tests at room temperature were very low and well within the acceptable range. Solutions tested included 8-8-8, 10-10-10, 6-6-12, 5-10-10, 6-12-12, and 8-16-8. A solution of potassium chloride (0-0-16.8) was included in this series to test the effect of potash alone. A relatively high corrosion rate (25.5 mils per year) was obtained indicating a chemical interaction between potash and other constituents in mixtures, since addition of potash to non-potash solutions in other studies reduced corrosion significantly.

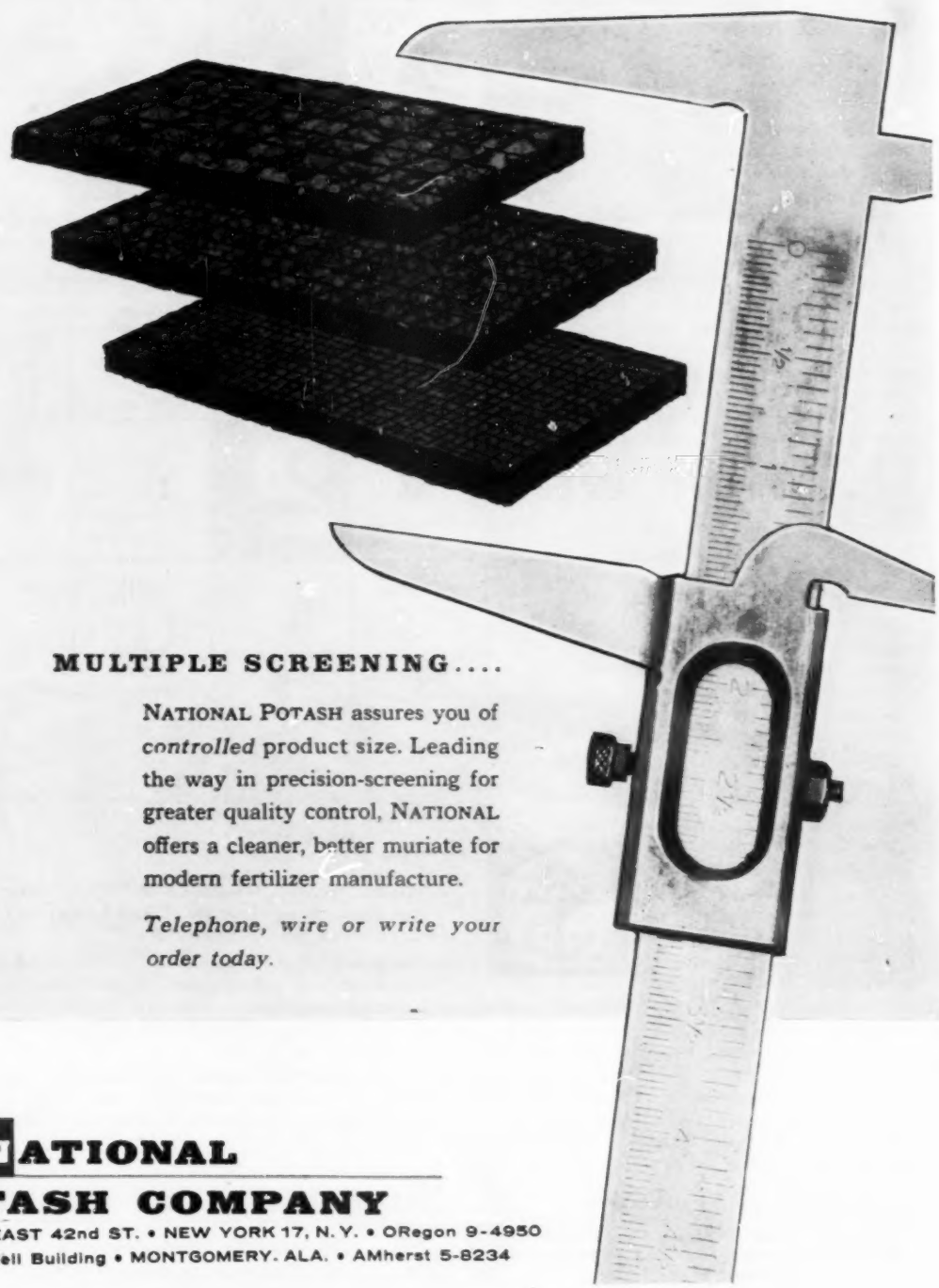
Tests were also made to determine the corrosive effects of liquid mixtures at elevated temperatures from 165-200°F. Although degrees of corrosion were greater at these elevated temperatures, all corrosion rates were still in fully acceptable range or very close to it. The following effects were noted by TVA investigators. **(1)** The high phosphate liquids (1-3-x) were three times as corrosive as the low phosphate (1-1-x) liquids tested; **(2)** The potash containing liquids (1-x-1) were 60% as corrosive as the non-potash liquids (1-x-0) tested; **(3)** The use of 0.1% sodium dichromate inhibitor decreased corrosion rate by about 95%; **(4)** Areation at 0.02 cubic feet per minute increased corrosion rate by 100%.

Mild steel was fully acceptable or very close to it under all conditions tested.

The established use of aluminum as a material of construction for tanks and application equipment for handling nitrogen solutions has raised questions concerning the corrosive effects of liquid fertilizer mixtures on aluminum.

One of the surprising results of the TVA studies on the corrosive effects of liquid fertilizers on eight aluminum alloys tested was the beneficial effect of muriate of potash. Corrosion was expected to increase because of the presence of the chloride ion, usually very corrosive to aluminum. In these tests the presence of potash (K_2O to N = 1) reduced corrosion by as much as 83% compared to non-potash solutions. Although the mechanism of the protection afforded by potash was not clearly defined, it appeared that the corrosion products, identified as ammonium alumino phosphates with part of the ammonium replaced by potassium, adhered closely to the aluminum forming a protective coating which reduced further contact of solution and metal.

The Measure of Quality



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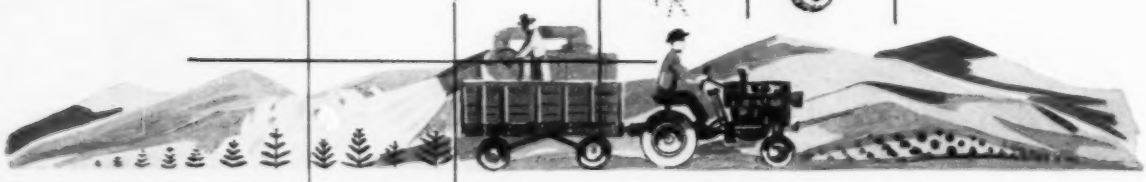


A recently compiled breakdown of Sulphur consumption in the United States, shows about 2% of the Sulphur goes into the manufacture of insecticides and fungicides.

Not much, perhaps, as tonnages go but no other use of Sulphur is more important with the possible exception of the 'wonder' drugs. It doesn't take much imagination to picture what would happen if the bugs and parasites were allowed to take over our crops and trees. Sulphur, along with other chemicals, is helping to protect our food supplies and foliage.

The role that TGS is playing in this constant fight against crop destruction is to see to it that the manufacturers of the insecticides and fungicides *always* have a ready supply of Sulphur, both solid and molten. This constant production and centralized distribution coupled with technical help is our contribution to industry.

SULPHUR PRODUCING UNITS

• Newgulf, Texas • Spindletop, Texas
• Moss Bluff, Texas • Worland, Wyoming
• Fannett, Texas

TEXAS GULF SULPHUR CO.

75 East 45th Street, New York 17, N. Y.
811 Rusk Avenue, Houston 2, Texas

The results of these studies indicated that aluminum appeared to be in a marginal category in regard to its use in handling liquid fertilizers depending on conditions of use. Considering a corrosive rate of less than 20 mils per year as acceptable and 20-60 mils per year as possibly acceptable, acceptable rates were obtained for all aluminum alloys in potash-containing solutions at room temperature (72°F). Acceptability varied, however, with conditions such as solution temperature, uniformity of corrosion over metal surface, and type of equipment, etc. The use of 0.1 per cent sodium dichromate as a corrosion inhibitor proved to be the most effective factor in decreasing the corrosive rate of liquid fertilizers on aluminum. With inhibitor, under practically all combinations of conditions studied, aluminum received a fully acceptable rating. The principal exception was 8-24-0 at a temperature of 122°F. Plants having coolers could cool the solution to non-corrosive levels prior to storage or shipment.

The corrosion problems which might be encountered in using aluminum equipment for handling liquid fertilizer solutions will vary with different fertilizer grades and conditions of use. It is suggested that the TVA studies will provide much useful information to those interested in pursuing this matter further.

Tests of the corrosive effects of liquid fertilizers near the boiling point on stainless steel indicated that corrosion rates were very low and most were negligible.

Summary

In summary, higher purity agricultural muriate of potash has proven to be a most suitable source of potash for use in liquid fertilizers. It is the least expensive form of fertilizer potash available and may be easily and safely handled in the plant. Like other materials used in liquid fertilizers, it does present certain solubility limitations on grades of fertilizers which can be made. These limitations will be dependent to a large degree on the source of supplemental nitrogen used in making the product. The analysis of grades which can be made will vary with regional temperatures and conditions of use. Studies indicate that muriate of potash may under some conditions exert a beneficial effect in reducing corrosion in liquid fertilizer plant equipment.

LITERATURE CITED

[1] Sohio Nitrogen Solutions for Liquid Fertilizer Manufacture. Sohio Chemical Company, Lima, Ohio, 1958.

[2] Private Communication, U. S. Borax Research Corporation, Anaheim, California, December 1957.

[3] Hatfield, J. D., Slack, A. V., Crow, C. L., and Shaffer, H. B. Jr., "Corrosion of Metals by Liquid Mixed Fertilizers," Agricultural and Food Chemistry, v. 6, No. 7, pp. 524-531, July 1958.

SURVEY PROBES FARMERS' FERTILIZER BUYING HABITS

By Elmer C. Denis, *Manager*
Research Division
Doane Agricultural Service, Inc.
St. Louis, Missouri

Almost 40% of all United States commercial farmers feel that they should have used greater amounts of fertilizer in 1958 than they actually did, according to a recent survey. Only 3.5% said they should have used less fertilizer on their 1958 crops.

To gain a better insight into fertilizer purchase patterns and "spheres of influence," the research staff of Doane Agricultural Service, Inc., recently conducted a survey of their countrywide farm panel, a representative sample of all commercial farmers with annual incomes over $2500.00.

Farmers were asked to evaluate the amount of fertilizer they used in 1958 in relation to their 1958 crops. Those farmers that said they used too much fertilizer (that is, they should have used less in 1958) were in a distinct minority.

Questions were asked to determine preference of farmers for bagged fertilizer. 1343 farmers (81.3%) reported the use of bagged fertilizer. 136 farmers (8.2%) used bulk or liquid fertilizers only, and an additional 166 farmers (10.1%) used no commercial fertilizer at all. Of the farmers who used bagged fertilizer an average of 1.85 brands per farmer was purchased in 1958 at the time of the survey (September).

A measure of the relative popularity between brands (or manufacturers' name) and between co-op and private brands was obtained. The 1343 farmers who used bagged fertilizer reported 2489 different brand purchases. Of these 2489, 577 (23.3%) were manufactured and/or distributed by co-ops. One or two of the co-ops were more important in frequency of purchase.

76.7% of the brand purchases was a product of private industry. These purchases, however, were much more evenly proportioned among the various distributors than was the case with the co-ops.

There were 89 purchases of bagged fertilizer which could not be identified either by brand, company, or type of manufacturer.

A regional comparison reveals there was little or no significant difference between number of different brands purchased by region; however, there was a difference in bagged vs. bulk and liquid in the various regions, with the West North Central, East North Central and Western regions showing a greater percentage of farmers using only liquid or bulk fertilizer. The percentage for these regions are 13.4%, 9.8% and 6.6% respectively. There was also a wide difference in fertilizer vs. no fertilizer by region. In the West North Central region almost 18% of the farmers used no commercial fertilizer while in the Western region this figure was over 20%. On the other extreme less than 1% of the farmers in the South Atlantic region used no commercial fertilizer.

Farmers were asked why they used the analyses they did and why they used the amount they did. Apparently, there are several important "spheres of influence" in deciding these questions, since there was an average of almost two responses per farmer to each question. The two major sources of outside influence were: (1) soil tests, (2) county agents, experiment stations and state universities. Soil tests appeared to have a slightly greater influence in determining the analysis of the fertilizer used than the amount of fertilizer. The influence of county agents, state universities and experiment stations was about equal in each.

The relative importance of magazines, radio and other media appeared to be much greater in helping the farmer decide on the analysis to use than the amount to use. Likewise, personal experience of the farmer had a much greater influence on the decision of analysis than amount. Dealers and manufacturers' salesmen were also much more influential in determining analysis than amount of fertilizer.

ARKANSAS

El Dorado Fertilizer, lost by fire a block long section of their rambling plant in El Dorado. Unofficial estimates of the loss ranged from $100,000 to $200,000, partially covered by insurance. The section covered mixing equipment and several thousand tons of bulk fertilizer. Owners are **Joe Wepfer and George I. Gilmore.**

CALIFORNIA

The Bunker Hill Company, San Francisco, has announced its intention to construct a $10,000,000 fertilizer plant in the Northwest, scheduled to go into production by July, 1960. **John D. Bradley,** president, said the production of fertilizer was an important and logical part of the company's planned diversification program.

The plant is scheduled to have an annual capacity of 200,000 tons of fertilizer products, making it one of the largest in the Northwest United States, he said.

The fertilizer will be manufactured from Bunker Hill's own sulfuric acid, which is a by-product of the Company's lead and zinc reduction plants at Kellogg, Idaho. Present acid production is 100,000 tons a year, and according to Mr. Bradley, this production can be substantially increased through construction of more facilities for collecting and converting additional waste gases from the reduction plants.

They have an option on a site near Kennewick, Wash.

* * *

Valley Nitrogen has cleared its site problem with the Fresno County Planning Commission, and work should by now be under way. The plant, as previously reported here, has been given a $9,000,000 budget by the Board. The site, 270 acres in extent, is at Helm and will employ some 60 people. **Chemical Construction** will design and build, expecting to complete in about a year.

* * *

Trietsch & Clark, Inc., have been granted a permit by the Fresno County Planning Commission to build at Fresno a fertilizer plant of which **Melvin D. Clark** is president and general manager. This will replace the plant destroyed by fire in July.

* * *

Westside Fertilizer Company, Fresno, has filed articles of incorporation. Directors are **Howard B. Thomas, Charles E. Small, Roger E. Flipps, John F. Hopkins and Philip H. Wile.**

* * *

The Valley Natural Fertilizer Company, Bakersfield, has opened a plant at Fresno on a three-acre leased site. **James Paul** and **William Wetzel** are owners.

FLORIDA

Armour Fertilizer's new plant near Davenport is rapidly taking shape, and is expected to be in operation about the first of the year, according to the manager, **G. W. Gosdin.**

Armour may be the first to mine phosphate within the City limits of Bartow. The commissioners have expressed themselves as "receptive" to the Armour proposal that a large lake will result, but legal details, under a law passed three years back, were still to be ironed out.

* * *

Allied Chemical and Dye have set up a $310,000 plant at Sanford, consisting of a pump house and nine 45,000 gallon storage tanks for liquid fertilizer. The transaction was handled by **H. P. Bill** from Hopewell. Local reaction was happy because Allied asked no favors, no concessions, no dramatic build up. A pipeline from the St. Johns River will bring materials to Sanford.

* * *

Citrus Culture's plant at Mount Dora was recently destroyed by fire. They plan to rebuild as soon as the site can be cleared by the salvage people, according to the president, J. E. Fortner.

* * *

Chase Fertilizer people, Sanford, were recently alarmed by smoke pouring from their plant. The fire department was called, but no fire developed, according to **Randall Chase,** president.

ILLINOIS

Illinois Farm Supply, which had announced closing of their Tuscola plant, and which had given personnel an opportunity to find jobs elsewhere, through gradual shifting of production to their plant in East St. Louis, now state that a reappraisal of demand has caused them to change plans. The plant will not be closed. It is a $1,250,000 facility, dedicated in October 1955.

* * *

Graymont Cooperative has completed its new bulk plant at Bloomington, adjoining their 200-ton phosphate facility, built ten years ago. The new structure has four 100-ton bins.

KANSAS

Cooperative Farm Chemicals has set a definite date for operation of its expanded plant at Lawrence. October 1 of next year is when they expect the new $6,000,000 facilities to start producing ammonia and urea.

* * *

Spencer Chemical's Jayhawk plant was chosen as the N plant to visit by a team of Polish delegates who recently made a tour of the U.S. chemical industry.

LOUISIANA

Green and Reedy Fertilizer, Franklinton, has been chartered with listed capital stock of $210,000.

MARYLAND

Organic Development Company of Fullerton, is changing the company name January 1st to **The Natural Development Co.** They are making some equipment modifications in the plant to increase mixing and bagging capacity.

* * *

Hampstead Fertilizer Co., Hampstead, has discontinued operation and is selling plant and equipment, according to **H. L. Twigg,** treasurer and manager.

MICHIGAN

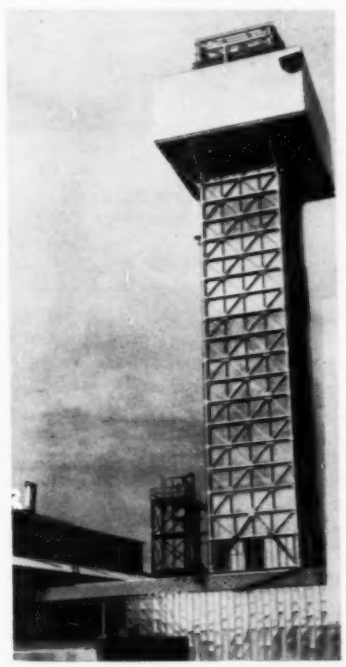
Armour Fertilizer scheduled first operations November 10 for their new plant near Owosso, according to word from **L. L. Sparks,** general manager of the newly formed Owosso division.

Production of complete, granulated plant foods in various formulas will be stepped up progressively until the plant is in full operation early next year. They will be marketed under the Armour Vertagreen, Pebble, and Big Crop brands. First shipments of plant foods in bags will be made in January.

The plant will employ between 75 and 100 people when it is in full operation. They will be selected from local applicants over the next few months, according to **J. H. Downing,** plant superintendent.

The plant is located on a 78-acre tract. The main manufacturing and storage building covers approximately 60,000 square feet. There is a separate office building and a garage. Construction started in September, 1957, and there is still some construction work to be done.

Mr. Sparks formerly was employed in the Chicago Heights, Ill. division of the company, and Mr. Downing formerly was with the Carteret, N. J. division.



This all-aluminum prilling tower will produce solid urea at Spencer Chemical Company's Henderson Works. The tower is the final unit of a 100-ton-per-day urea plant which has been under construction for the past year. Currently, the urea synthesis section of the new plant is "on stream" producing solutions for mixed fertilizer and direct application. Company officials estimate that the prilling towers will be put into operation sometime during the latter part of this month.

MISSISSIPPI

Coastal Chemical's $2,000,000 phosphate fertilizer plant at Pascagoula has been completed by **Fluor Corp.** This plant, designed and engineered by Fluor, first in the United States to utilize the French-developed **St. Gobain** phosphate fertilizer process, includes a 75 ton-a-day phosphoric acid unit and 350 tons-a-day granulated ammonium phosphate fertilizer unit.

This ammonium phosphate process gains considerable flexibility in the production of a wide variety of high analysis formulas; for example, triple superphosphate can be manufactured as well as 14-14-14, 6-24-24, and other ammonium phosphates with or without potash.

* * *

First Mississippi has announced that the $1,350,000 multiwall bag plant project will definitely be located at Yazoo City. Official announcement of the Yazoo City location was made by **Fred A. Anderson,** president of the corporation. Mr. **Owen Cooper,** chairman of the board, reported that First Mississippi will participate in the construction and ownership of a $4,000,000 ammonia plant in Chandler, Arizona; has authorized the purchase of 15 nitrogen solution railroad cars.

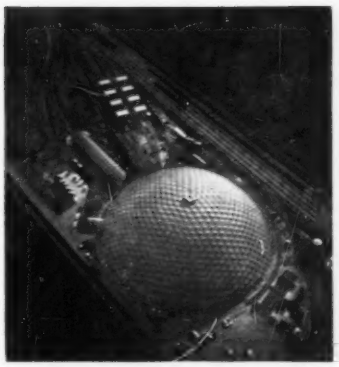
MISSOURI

Mississippi Valley Chemical has opened for business in Palmyra to produce and distribute liquid fertilizer, tailor-made to soil analyses. They will also make and distribute all types of liquid fertilizer applicators. The plant is locally owned, operated by **Lyndell Gillespie,** with **Elbert Schenk** as salesmanager.

The plant consists of eleven tanks, five for raw materials, one as a mixing tank and five as storage for finished product. A storage building for dry chemicals and an office building complete the set-up. Dealers are being established in surrounding territory. In the future they plan to package the product in small containers for lawns and gardens.

NEW JERSEY

Charles Pfizer have opened a distribution center in Clifton containing 160,000 square feet of space. From here they will, in addition to agricultural products, distribute their wide line of pharmaceutical and chemical goods.



Union Tank Car's giant dome in Baton Rouge is as high as a 10 story office building, big enough inside to hold a football field. It houses regional tank car repair and other maintenance facilities for Union Tank. They are building another one at Wood River, Ill.

Bennett & Clayton, Cranbury, are planning to enlarge the plant and put in new machinery such as bagging equipment, etc. **L. Graham Campbell** has resigned from **Chamberlin & Barclay,** and he and **Edward D. Powers** have bought B&C. Mr. Powers will continue as president, with Mr. Campbell as executive vice-president.

NEW MEXICO

Farm Chemical Resources Development Corp., Carlsbad, has completed a concrete lined circular shaft, 15 feet in diameter to a depth of 1,695 feet on their potash properties. This carries it through the ore body and permits large-sample testing. FCRD holds 15,099 acres of federal leases and 6,331 acres in the potash basin where the present shaft is located.

NORTH CAROLINA

Wakelon Fertilizer Co., Inc., Zebulon, has been organized with $6,000 capital stock by **W. P. Searboro, H. H. Eddins, R. Berdon Eddins** and **Foster D. Finch.**

NORTH DAKOTA

North Dakota Nitrogen, Inc., is reported unofficially to be negotiating with the Corps of Engineers for a site at the Garrison Dam for a $15,000,000 plant. The Army owns at this point a 2,000,000 ton supply of lignite coal which the fertilizer concern is said to want to buy. **Tom Kleppe** of Bismark is listed as president.

Reports continue that the plant desires to occupy 700 acres below the

dam for plant, warehouses and a demonstration farm; that it would produce some 150,000 to 170,000 annual tons of fertilizer; require two years to build; employ 200. The government coal stockpile is estimated to last for 5 to 8 years, when the concern would turn to lignite mined in North Dakota.

TENNESSEE

Oolite Mineral has begun excavation of the first of four mineral tracts near Cumberland City. The first is a magnesium deposit.

TEXAS

Olin-Mathieson was host to a delegation of Latin American students recently in Houston as part of a 4-H Club invitational tour. At the O-M plant, superintendent **Joe Gibbs** explained how high analysis fertilizers are made.

* * *

Consumers Fertilizer Co., Inc., has purchased a mill property in Henderson which will be converted into a plant to produce organic fertilizer. It is to cost $125,000 and be modern in every respect.

VIRGINIA

Virginia Dehydrating Co., Inc., Linville, has been established to produce both organic and inorganic fertilizers.

WASHINGTON

Mora Chemical, Seattle, have been licensed to produce the fertilizer pellet developed by **Crown Zellerbach** for forest seedlings. Three-quarters of an inch in diameter, this pellet goes into the hole as the seedling is planted, and dissolves slowly. It costs less than $10 per acre and has demonstrated a 60% increase in growth over control seedling plots.

WISCONSIN

Farmco Service Cooperatives, Madison, are producing and distributing a new fertilizer, made by "changing the position of molecules in phosphate". This is said to remove the water molecule and therefore correct the problem of phosphate changing to insoluble forms when added to the soil.

AUSTRALIA

Bellona Island in the British Solomons is the largest of the phosphate sources unearthed by the joint search undertaken by Australia and New Zealand. It offers about 8,000,000 tons of low grade rock. Australia has high grade rock sources at present but they are expected to be worked out within the next 40 years.

BELGIUM

Fertilizers & Chemicals, Ltd., Israel, in a dramatic switch has contracted to provide chemical and engineering know-how for a Belgian dicalcium phosphate plant to be built by **Krebs & Co.,** Paris.

CANADA

British American Oil has brought into production its $50,000,000 gas processing plant at Pincher Creek. It can produce among other items 435 daily long tons of elemental sulphur.

ENGLAND

Lawes Chemical has resumed production in its main fertilizer plant at Barking, Essex. The plant has been modified and adapted to steam granulation. This, added to their "High Dry" process, will now supply a better sowing and keeping fertilizer, they announce.

HUNGARY

Borsod's fertilizer plant is nearly ready to start turning out its 133,000 annual metric tons of nitrogen fertilizer. The plant was financed by the USSR.

INDIA

The US Export-Import Bank's president, visiting Bombay, has announced a sympathetic ear toward any request for financial aid in setting up a fertilizer plant in a private sector, preferably in South India. The aim of the bank, as he put it, is to invest in money-saving projects, and home production of fertilizer would save dollars by reducing the importation of fertilizers from the USA. He is **Samuel C. Waugh.**

JAPAN

Japan Gas-Chemical Industries Ltd. plans expansion of an ammonia and urea plant through a $2,300,000 credit authorized by the **US Export-Import Bank.** At present they produce from natural gas 100 daily metric tons of ammonia and 80 daily metric tons of urea. The expansion would double these figures. Working with **Chemical Construction Corp.,** they expect the new plants to be completed by March. The whole $2,300,000—with the exception of freight, insurance and handling,—will go to US sources.

KOREA

F. H. McGraw and **Hydrocarbon Research** are rapidly nearing completion of their joint $40,000,000 plant on what was the raging battlefield of the Han River.

SPAIN

Amoniaco Espanol, a Spanish concern in which two Italian firms, **Montecatini** and **Finmeccanica,** are said to be interested is planning a fertilizer plant in Seville.

HONORS

J. Peter Grace, president of **W. R. Grace and Co.,** has received the 1958 Gold Medal of Merit of the Wharton School Alumni Society of the University of Pennsylvania.

The award is given yearly "for outstanding business achievement." Mr. Grace accepted the medal and delivered an address at the society's annual dinner Nov. 13.

As president of the company since 1945, Mr. Grace has led its development in chemical and paper manufacturing while advancing its South American industrial, agricultural and commercial enterprises and its operations in ocean shipping, banking, insurance, outdoor advertising and air transportation.

He represents the third generation of his family to head the company, founded by his grandfather, William Russell Grace, in Peru more than a century ago.

In addition to his business interests, Grace is chairman of the 1958 Greater New York Fund, president of the Catholic Youth Organization in New York, treasurer of the National Catholic Community Service and a leader in numerous other humanitarian activities.

Previous recipients have been Charles E. Wilson (then president of General Motors Corp.), Benjamin F. Fairless, Crawford H. Greenewalt, Richard K. Mellon, Thomas B. McCabe, Cleo F. Craif, Henry Ford, 2nd, and Ralph J. Cordiner.

Conservation Applications Exceed Soil Bank Goals

USDA says that farmers have filed applications for 1959 contracts in the conservation reserve of the soil bank which offer acreage exceeding the goals for most states. The national goal was 12,500,000 acres. The applications total as of the October 24 closing, more than 20,000,000 acres.

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The International Scene

AUSTRALIA

Survey of Manufactures Can Be Helpful to Industry

The Australian government has completed its semi-annual survey of manufacturing activity, which is published in a report, copies of which are available for review in any field office of the US Department of Commerce. We mention this because the report includes data on what Australia is producing that contributes to, or competes with, our own production of fertilizers.

Two States Share Christmas Island

Under a new agreement between Australia and New Zealand, governing their mutual rights and interests in Christmas Island, in the Indian Ocean, New Zealand's position as an equal partner with Australia in the Christmas Island Phosphate Commission will be fully preserved.

The Minister of Agriculture, C. F. Skinner, said the new agreement had been made necessary by the transfer of Christmas Island from the United Kingdom to Australia. It maintained the arrangements established by the Christmas Island agreement of 1949, with the amendments required to take account of Australia's position as administering authority.

"Under the new agreement the Australian Government in administering the island, will consult with the New Zealand Government about any matter which might substantially affect the working of the phosphate industry," said Mr. Skinner. "The agreement also provides for the situation which will arise when the Phosphate's Commission's operations come to an end.

Mr. Skinner said that since 1948 the two governments jointly had been operating the phosphate industry on the island and had established the Phosphate Commission in 1949, when the island was administered as part of the colony of Singapore.

The United Kingdom had, at the beginning of 1958, separated the administration of the island from that of Singapore. The remaining steps effecting the transfer to Australia had recently been completed, and the transfer took effect from October 1.

AUSTRIA

Linz Exports 73% Of N Production

The Austrian Nitrogen Works in Linz produced during the 1957-58 season 706,000 tons of nitro-fertilizer. 73% of this went to foreign markets, increases showing especially in the Asian demand, which alone took 30% of the overall Linz deliveries. In the first half of 1958 the Linz works broke the previous year's production record for the same period by 4½%.

BRAZIL

Freed Currency to Aid Fertilizers

The government of Brazil has set up a new currency plan which permits foreign exchange on a free market instead of via the government itself. It has also established a rate of 80 cruzeiros per dollar for some priority imports, among which you will find petroleum fertilizers. This program is to pave the way for a currency stabilization plan coming up presently.

ENGLAND

Fisons Reveals Sales Figures

Fisons Ltd. has revealed that its fiscal year, ending June 30 showed a gain of $7,500,000 over the year before, with a total for the past season of $132,700,000. Fertilizers represent 75% of sales.

GERMANY

Marked Increase In N Fertilizers

A marked increase in production of nitrogenous fertilizers in 1957 resulted from new construction and expansion of existing facilities. The output of synthetic nitrogen was 1.1 million tons and may soon reach 1.5 million tons as the country's capacity continues to increase.

Production of phosphatic fertilizers was up 7 percent in 1957 from that in 1956, principally because larger supplies of Thomas phosphate (Thomas meal) were available from steel mills, according to the Federal Ministry of Food, Agriculture, and Forestry.

Compound fertilizers containing several plant foods are obtaining a larger share of the market, both in West Germany and the rest of Europe.

HONG KONG

Getting Fertilizer Trade From Communist China

Hong Kong, which has always been flooded with goods from the mainland, has experienced a reversal of trade. Communist China—because of a rift between it and Japan—is having to buy chemicals and fertilizers elsewhere. Hence the Hong Kong upsurge. Chinese merchants in Hong Kong have been holding large stocks in warehouses for years. Japan undercut their prices and the goods remained in storage. China has now bought at distress prices, some merchants are believed to have suffered losses of 50 to 60% on their deals.

KOREA

Ministry Completes 1959 Fertilizer Plans

The Korean Agriculture-Forestry Ministry has cut by 5% the quantity of fertilizer to be used in the period ending July 31, 1959 to 892,339 tons. This cut is intended to encourage the use of home made compost, which is a policy of the Government.

This tonnage total includes 43,500 tons carried over from the 1957 Fertilizer Year, and purchases of the rest will be handled with the $13,000,000 left over from the previous year and the $30,000,000 of 1959 ICA funds. 265,540 tons of the total will be imported by private firms.

The tonnage breaks down into 565,201 tons of nitrogenous fertilizer; 319,938 of phosphatic; 7200 of potassium fertilizer. More than 600,000 tons will be about equally divided between barley and rice growing.

MEXICO

Plans Afoot to Utilize Sulphur, Now Wasted

Torreon is being touted as "the prime producing center of phosphates in the republic" in the very near future.

A group of business men, especially invited by Carlos Ramirez Ulloa, head of a Federal commission for spurring mining development (as well as director of the Federal Electrical Commission) have been mak-

ing a tour of the state of Coahuila, prior to instituting investments in the area.

Actually, today, Mexico imports all phosphates used in production of fertilizers. This, according to Ulloa, is an unbalanced situation since there are millions of tons of phosphoric rock which have not been exploited, with these deposits in a zone comprising the states of Coahuila, Zacatecas and Nuevo Leon, exactly along the borders of these entities.

Torreon, therefore, is the ideal point for processing, Ulloa said. The Penoles metallurgic plant there is wasting hundreds of tons of sulphur daily, and this could be used for production of superphosphates.

Ulloa indicated that with 300 tons of acids and an equal quantity of sulphur waste, Torreon could produce 500 tons of superphosphates daily, with this being double the annual consumption of this product in the area.

NORWAY

New Production Record Established

Norsk Hydro produced a new record with their 1957-58 delivery of 230,500 tons of N. Exports amounted to 75% of total sales, which were valued at Kr. 485,000,000.

SOUTH AFRICA

Now Able to Produce 25% of Phosphatic Needs

The Union is now able to produce nearly 25 per cent of its phosphatic fertiliser requirements from its own resources and it is hoped that local production can be steadily expanded so that 50 per cent of the requirements can be met from local resources in the near future, the Minister of Agriculture, Mr. P. M. K. le Roux said at a function at the factory of African Metals Corporation in Bellville. The occasion was the production of the one-millionth ton of Langfos fertiliser.

In spite of the efforts to make the Union less dependent on the import of phosphates, by making available 24,000 tons per annum by Foskor and 20,000 tons by Amcor, it is calculated that the annual fertiliser consumption is equivalent to 180,000 tons of phosphor oxides, the Minister said. The Union, therefore, supplies only 25 per cent of its requirements.

Dr. F. Meyer, chairman of Amcor, said that the mining of the Langebaan rock-phosphate and the establishment of the factory in Bellville was undertaken because the Union was cut off from its phosphate sources during the war. The production capacity of the factory has increased during these 16 years from 35,000 tons to 110,000 tons at the present time. In view of the strong demand an expansion of the production capacity is under consideration.

SPAIN

Potash Congress Hailed As Outstanding Contribution

The Sixth International Potash Congress, organized by the International Potash Institute and attended by delegates from 20 countries, was held in Madrid in September. The main theme of the discussions was the utilization of potash as a fertilizer, under conditions of a water deficit or an excess, with the resultant effect upon plant growth and morphology.

Papers on the subject were read by British delegates—Professor J. P. Hudson, of Nottingham University, and Professor T. Wallace, director of the Micronutrient Research Unit at Long Ashton, Bristol.

No formal resolutions were presented on the conclusion of the congress but it is understood from a U. K. delegate that the U. K. delegation regards the meeting as having provided the most valuable data regarding the independent lines of research on potash utilization which are now in progress.

UNITED STATES

Exports Expected To Decline

It is predicted that US exports of fertilizers will drop from the 1957 record high of $135,000,000. The decrease of about 7.5% anticipated will be due to increased world competition and our reduced supply of domestic ammonium sulfate for fertilizer purposes due to cutbacks in steel operations.

NAC Holds Annual Meeting

Jackson V. Vernon, vice-president, Food Machinery and Chemical Corporation, New York, and Charles H. Sommer, vice-president, Monsanto Chemical Company, St. Louis, were re-elected president and vice-president, respectively, of the National Agricultural Chemicals Association at elections held during the Association's silver anniversary meeting in Savannah, Ga. Also re-elected for another year were Lea S. Hitchner, executive secretary and treasurer, and Miss Lee H. Grobe, assistant treasurer.

Mr. Vernon and Mr. Sommer had served in their respective offices for one year and were unanimously re-elected by the board of directors.

Four new members of the board were elected: Evan T. Collinsworth, Jr., president, Velsicol Chemical Corporation; William R. Dixon, general sales manager, The Dow Chemical Company; Frank M. Feffer, Sr., president, Arizona Fertilizers, Inc.; and Robert S. Thompson, president, Thompson-Hayward Chemical Compan, Kansas City.

A prediction that sales of farm pesticides will top $1 billion by 1975 was made by the president in the opening address.

Mr. Vernon stated that the greatly increased demand for pesticides would be stimulated by the food and fiber needs of a population already in excess of 175 million and growing rapidly, as well as the essential role of pesticides in the elimination or control of malaria and other insect-borne diseases at home and in many foreign lands.

The strong trend in recent years to business-like farm operations has resulted in increased acceptance of chemical insect, weed and disease control as good farming economics, the nation's agricultural chemicals producers were told.

John L. Gillis of St. Louis, Monsanto Chemical Company's vice president for marketing, said that there are now more professional farm managers in some states than there are county agents.

Service to agriculture based on faith in the future of the farm economy, a generous investment in research, and down-to-earth personal selling were described by Frank S. Washburn, general manager of American Cyanamid Company's agricultural division, as the dominant factors in the growth of the crop chemical industry.

Over 600 leaders from industry and government attended.

Sackett Equipment PAYS ITS OWN WAY

Sackett Builds The Equipment You Need

- **Continuous Granulating Units**
- **Plant Modernization Programs**
- **One Man Batch Weigh Systems**
- **Mixing and Shipping Equipment**

Aerating Equipment
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Belt Conveyors
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Conveyors
Coolers
Crushers
Disintegrators
Dry-Mixing Units
Dust-Arresting Equipment
Fume Scrubbing Systems
Hoppers and Spouts
Materials Handling Equipment
Milling and Screening Units
Multiple Hopper Batching Systems
Oil Fired Dryers
Plant Mechanization Systems
Pneumatically-Operated Gravity Batch Mixers
Pneumatically-Controlled Valves
Pulverizers
Sackett Timken Bearings
Sacking Units
Scales
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Shipping Units
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GET THE RIGHT ANSWER TO YOUR PRODUCTION PROBLEMS *get Sackett*

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Agricultural GRANTS-IN-AID

Through a $2,600 annual grant from the American Potash Institute, Oregon State College has started a search to learn why some western Oregon soils tend to "lock up" reserve supplies of potassium while other soils make this important element readily available for crop production.

The 3-year project, totaling $7,800, was announced by Oregon AES soil scientists T. L. Jackson and M. E. Harward, who are supervising the research. Hugh Gardner, OSC Soils Department research assistant, will conduct the trials.

$20,000

An agricultural research program of grants-in-aid totaling nearly $20,000 will be sponsored in 1958-1959 by Climax Molybdenum Company, a division of American Metal Climax, Inc. In announcing the program, William M. Stilwell, manager of agricultural sales & development, reported that this includes work at six universities and two independent research foundations.

Laboratory tests and field trials will be designed to gain insight into the crop response to molybdenum on various specific soils, and also the degree of response of these crops when seed-treated with molybdenum. Included in the latter area of research will be special germination studies. Crops which are expected to figure prominently in experiments during the year are alfalfa, peanuts, soybeans, pasture crops and coffee.

The following colleges and universities will receive Climax agricultural grants-in-aid: University of California; University of Georgia; Oregon State College; Purdue University; Rutgers University; and University of Wisconsin. In addition, Southwest Agricultural Institute of San Antonio, Texas, and IBEC Research Institute of New York (which is conducting agronomical studies in Brazil (will be issued grants to conduct further work on molybdenum response with specific crops.

$48,000

What food substances in the cotton plant attract boll weevils?

Which of these substances are essential for boll weevil reproduction?

Can you grow a cotton plant weevils won't attack?

Why does the cotton plant set and mature less than half its squares and blooms?

Answers to questions like these are the aim of two high priority research projects, unusual not only in their nature but in their administration. The first two projects are being conducted through cooperative agreements with the U. S. Department of Agriculture's Agricultural Research Service.

If the substances can be identified, they may be combined with insecticides to kill boll weevils before eggs are laid. Another possible approach is the elimination of the substances from the plant through breeding.

In either case, the substances first must be isolated and identified by researchers.

The other research project calls for a basic investigation of fruiting control in cotton. The fact that the cotton plant normally sets and matures less than 50 per cent of its squares and blooms has been of great interest for many years.

The actual research work on the projects will be conducted by the Agricultural Research Service in cooperation with two Cotton Belt land-grant colleges. A total of $50,000 has been allocated for the boll weevil project. The Cotton Council, through the Foundation for Cotton Research and Education, has allocated $20,000, and the USDA and the Texas Experiment Station will spend $30,000.

The foundation has awarded $18,000 and the USDA and the California Experiment Station $30,000, bringing the total to $48,000 for the boll shed project.

$1,000,000

A $1-million Federal Government agriculture research building will be erected on the Canadian Dominion Experimental Farm near Fredericton.

East Asks Soil Laboratory

Five Eastern states have sent representatives to USDA, asking the establishment of a soil research laboratory for that section of the Nation: New York, West Virginia, Maryland, New Jersey and Pennsylvania were represented. No specific location was mentioned.

HELP YOURSELF TO BIGGER PROFITS

PHOSPHATE PRODUCTION
No other process begins to compare with *way-ahead* Sackett SUPER FLO in making normal, fortified and triple super-phosphates of premium quality at *way lower* cost.

MIXED GOODS MANUFACTURE
Your investment in the latest Sackett Methods of producing conventional fertilizers is *guaranteed* to pay handsome returns. We are anxious to prove it.

MODERNIZATION PROGRAMS
Step ahead of competition by entrusting your fertilizer expansion and modernization facility programs to our care. Many of the most forward-thinking fertilizer producers are glad they did.

GRANULAR FERTILIZER
Sackett Equipment leads the field in Granular Production.
The names of the fertilizer companies who have selected Sackett Granulating Processes above all others, read like a "Who's Who in Industry."

NEW PLANTS
Invest your dollars wisely by having Sackett build your new plant. We do the whole job . . . from the inception stage thru building construction and equipment fabrication to operating plant. See us for guaranteed results.

There is nothing that appeals to a man's reason more than plain facts. And, one plain fact is this . . . you can help yourself to bigger profits by resolving ***now*** to replace wasteful obsolete plant equipment with the latest rock-bottom cost methods as exemplified in Sackett Production Processes and Materials Handling Equipment. Why not start the ball rolling by writing or phoning us today?

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Architects and *Manufacturing* Engineers to the Fertilizer Industry Since 1897.

America's Foremost *Creative* Designers & Builders of Commercial Fertilizer and Superphosphate Plants . . . Related Production Equipment

PEOPLE in the Industry

Michiana

Michiana Chemical Company has announced that Ted J. Nickolas of Lansing, Ill., accepted the position of superintendant at the company's plant in Niles, Mich. He will supervise the remaining equipment installation and be in charge of all plant operations, from manufacturing to shipping.

PCA

At a recent meeting of shareholders of P.C.A. Limited, John W. Hall was elected a Vice President and a Director of P.C.A. Limited. Mr. Hall will also continue as the Vice President of Sales, a member of the Board of Directors, and a member of the Executive Committee of the parent company, Potash Company of America.

F. O. Davis, president of Potash Company of America, announced the appointment of Houston N. Clark to the position of assistant to the president.

Mr. Clark joined Potash Company of America in 1941. Since August 1, 1956, he has served as general superintendent of PCA's Carlsbad and Dumas, Texas, plants.

PCA announces the appointment of Robert Billings as sales representative for the states of Iowa, South Dakota, Nebraska, Kansas, Oklahoma and Colorado. Mr. Billings, although living in Ames, Iowa will work out of, and under the supervision of their Peoria, Illinois, office.

Billings

Central Farmers

Central Farmers Fertilizer Corporation, Georgetown, Idaho, has announced the resignation of Charles Miller as materials manager at its plant there.

Sunland

Ralph L. Brant has been named general manager of Sunland Industries, Inc., of Fresno, Cal.

He succeeds the late Frank A. Easton, who died October 9th.

Mr. Brant has been an employee of Sunland since 1942 and has been the assistant general manager for a year.

Mr. Brant's appointment was announced by Beverly H. Jones, chairman of the board, who also announced the appointment of Henry E. Dunklau as purchasing agent. Mr. Brant has been serving as purchasing agent. Mr. Dunklau was his assistant.

Knoxville

Bennett E. Brown, former board member and secretary of the old Knoxville Fertilizer Co., Knoxville, Tenn., has been made manager of the division by American Agricultural Chemical.

Scott

Victor Renner has been made a vice-president of O. M. Scott & Sons. He will continue as director of research. He has been with them since 1937.

Spencer

Sanders

Campbell

Two changes in its Southeast district agricultural sales organization have been announced by Spencer Chemical. Kirk Sanders, formerly manager of the Southeast district which has its headquarters in Atlanta, has been put in charge of special projects for the district and will continue to work out of the Atlanta Office. Tom Campbell, formerly North Carolina sales representative, will become Southeast district manager.

Stauffer International

Frank B. Walker has been appointed sales development manager, Latin America, by the international division, Stauffer Chemical. Mr. Walker, who prior to his promotion was a technical representative of Stauffer's agricultural chemicals division stationed in New Orleans, will be headquartered in Sao Paulo, Brazil. He joined Stauffer in 1953.

Escambia

Three new officers have been named by Escambia Chemical Corporation, R. U. Haslanger, president, has announced. They are John B. Clopton, vice president and director of sales; Albert E. New, vice president and director of production, and Dr. W. Mayo Smith, vice president and director of research.

Mr. Clopton, who was appointed director of sales in April, will continue through the New York office to direct sales of the company's products. Mr. New, who has served as technical director in the manufacturing division since coming to Escambia in June, 1956, will have charge of the company's three plants near Pensacola, Florida. Dr. Smith, who has been with the company since it was organized in 1954, was named director of research early in 1958 and is now located at Escambia's recently opened research center in Wilton, Connecticut.

US Borax

J. M. Gerstley, president of United States Borax & Chemical Corporation, has announced the appointment of Hugo Riemer to the recently created position of executive vice president of the company. Mr. Riemer was also elected to the board of directors of the Company as was Norman Travis of London, England.

Mr. Riemer is well known in chemical and fertilizer circles in the USA having been with the Allied Chemical Corporation for over 20 years. His last position with the company was as president of its Nitrogen Division.

Currently a director of Borax Holdings Limited of London, Mr. Travis succeeds D. Abel Smith who has resigned. Before joining Borax Holdings Limited, Mr. Travis was for many years a member of the staff of Imperial Chemical Industries Limited and was recently managing director of British Visqueen Limited, a jointly owned subsidiary company of Imperial Chemical Industries and Union Carbide and Chemical Corporation.

Calspray

Dr. Lemac Hopkins has been named district manager of the Southwest area for the California Spray-Chemical. The appointment, effective immediately, was announced by C. E. Cody, Calspray's regional manager, marketing—West.

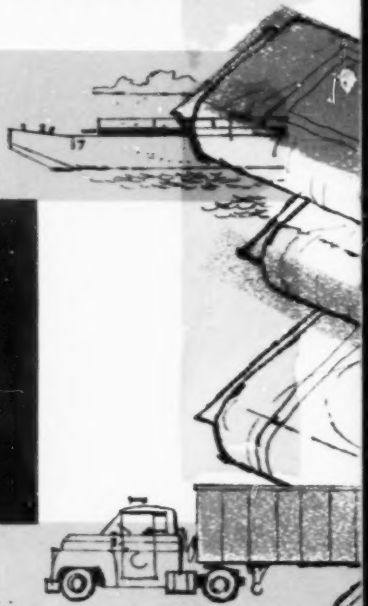
From his office in Phoenix, Arizona, Dr. Hopkins will supervise Calspray's sales operations in Ari-

Straight facts
from the field
that single out the ideal triple selection
. . . just as the soil test is the basic factor in finalizing ingredient selection, so also does International look to the basic experience and judgment of people in the field to help chart new courses in phosphate products . . . and for direction that improves primary fertilizer performance and develops superior finished goods.

These manufacturers report
THE FIELD FACTS

M. K. Miller, *President*,
Green Belt Chemical Co.,
St. Paris, Ohio — Bryant, Indiana
"We grew up with International Triple Super. Right from the start International worked with us to smooth out production and reduce costs."

Mrs. Grace Koos Anderson,
***President*, N. S. Koos & Son,**
Kenosha, Wisconsin
"In the many years we have used International, they never let us down."



Archie Edwards, *Manager*,
Red Star Fertilizer Division,
Sulphur Springs, Texas
"Service is a mighty big reason we contract for International's Triple."

A. C. Norris, *President*,
V. W. Norris & Son, Inc.,
Rushville, Indiana
"We like International's Triple and the way they do business."

George H. Alber, *President*,
Marion Plant Life Fertilizer Co.,
Marion, Ohio
"We like the way it ammoniates . . . and the granulated product we get. It's high-grade phosphate, costs less per unit."

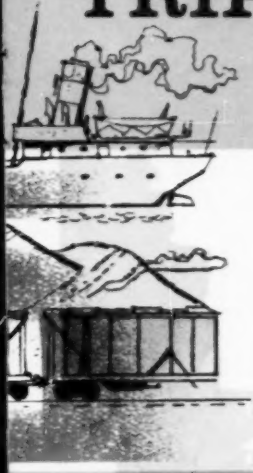
J. Raymond Myers, *Production Mgr.*,
Fertilizer Dept., Eastern States
Farmers' Exchange, York, Pa.
"International has proved that barge shipments (by Allegheny) are practical. Shipments of Triple Super bring immediate savings in shipping costs."

Damon Robinson, *Manager*,
Plant Food Division, Kelly-Weber
& Company, Inc., Lake Charles, La.
"International's charter carports of Triple help us use our water life-line to best advantage."

Alex Mooney, *General Manager*,
Fertilizer Division, Canada
Packers, Ltd., Toronto, Canada
"Our first shipment of Triple worked fine . . . so have the rest. We're sold on ocean and lake-going vessel shipments. Comes through in fine condition."

A. H. Reffers, Gen. Mgr. (left), and
W. E. Jones, Mgr., Fertilizer Div.,
Northwest Co-op Mills, Inc.,
St. Paul, Minnesota
"Even after months of storage, your Triple crumbles like a cookie."

ON INTERNATIONAL'S TRIPLE SUPERPHOSPHATE...



E. D. Kingsbury,
Kingsbury & Company, Inc.,
Indianapolis, Ind.

"We like the way International emphasizes research, develops new products, pioneers new approaches to shipping and technical service."

E. W. Liggett, *General Manager*,
Bartlett and O'Bryan Fertilizer Co.,
Owensboro, Ky.

"Good product . . . good service . . . good people — that's the reason I buy Triple Super from International."

Don Peterson, Ashkum Fertilizer Company, Ashkum, Ill.

"International's Triple Super has earned its place in our plant. We can bank on its arriving in good physical condition for easy handling. We like the way the triple ammoniates."

A. B. Chrisman, *President*,
A. B. Chrisman Fertilizer Company,
Meredosia, Ill.

"I like the Full Orbit program. It's already helped us solve some business problems — it's full of ideas and suggestions that we're putting to good use."

A. R. Mullin, Gen. Mgr., Fertilizer Div. Indiana Farm Bureau Co-op Assn., Indianapolis, Ind.

"International's Triple hits a consistent high in product quality and service."

MINERALS International CHEMICALS

W. R. Edgecomb, *Treas.-Gen. Mgr.*,
Aroostook Hi-Test Fertilizer Company, Presque Isle, Maine

"We learned by experience; our ammoniation rate proved that International's Triple had superior ammoniation qualities we were looking for."

Ralph Fraser, *Vice President*,
Summers Fertilizer Company,
Baltimore, Md.

"Pushing barge shipments up the Mississippi has meant immediate savings at our inland plants."

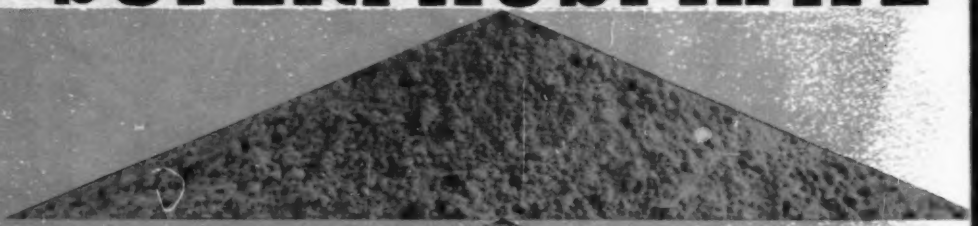
You can benefit...

from International's Triple Super Service
and proved dependable products

TRIPLE SUPERPHOSPHATE

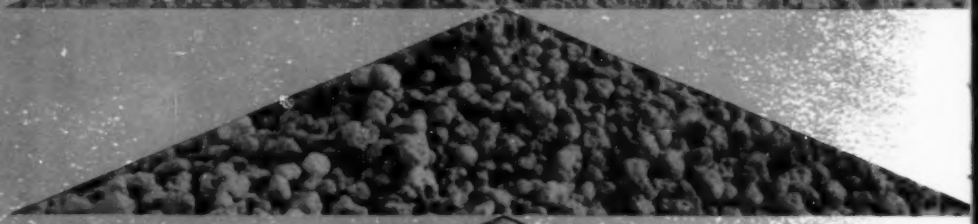
RUN OF PILE

International's fine-textured Triple provides uniform particle size, even density and proper moisture level that lets you ammoniate at higher rates, temperatures.



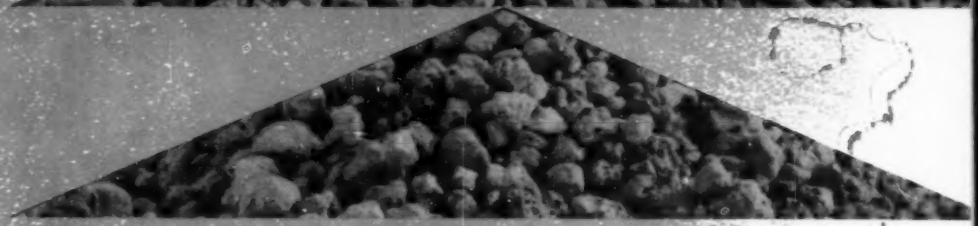
COARSE

International's coarse-textured Triple gives [illegible] excellent ammoniation batch after batch . . . promotes desirable agglomeration.



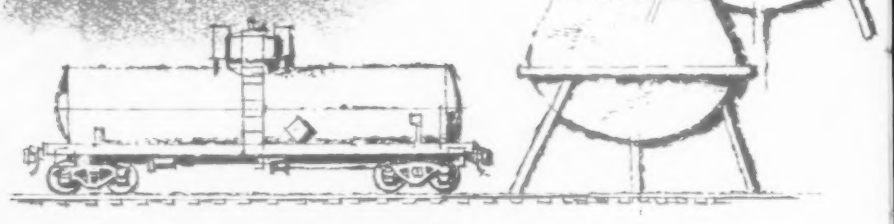
GRANULAR

International's new granular Triple is non-crumbling, free-flowing, makes granulation easier. Sponge-like structure of granules facilitates ammoniation.



INTERNATIONAL'S PHOSPHORIC ACID

Now you can make International your dependable single source of all high-analysis phosphate ingredients. International's high purity 53%-55% phosphoric acid comes direct to you in rubber-lined tank cars, shipped to meet your tightest schedules.



Creators of Living Minerals

MINERALS International CHEMICALS

PHOSPHATE CHEMICALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

Administrative Center: Skokie, Illinois

zona, and parts of Texas and New Mexico. He joined the company two years ago.

The appointment of Claude T. Davis as assistant to E. L. Stripling, Jr., California Spray-Chemical Corporation's regional manager—Southern, was announced recently. Mr. Davis will assist the regional manager in the development of sales policies, procedures and programs for the Southeast United States.

AAC

R. M. Richey has been named to fill the position of general superintendent of fertilizer production for The American Agricultural Chemical Company, vice president D. S. Parham has announced. Mr. Richey was formerly western division superintendent, and will now make his headquarters in New York, directing all fertilizer production operations for the company.

R. E. Lehmkuhl has been named to replace Mr. Richey as western division superintendent. He was formerly production superintendent for the Danville, Ill., and Seymour, Ind. Agrico plants. He will continue to headquarter in Danville.

West Va. Pulp

Robert L. Bentley, since 1951 assistant manager of the bleached board division of West Virginia Pulp and Paper, and who joined them in 1947, has been made manager of their Kraft division at Charleston. There he succeeds L. Frank Thompson, who has been made manager of West Virginia's Hinde & Dauch division.

Sturtevant

Clayton F. English, executive vice president of Sturtevant Mill Company, Dorchester, Mass., was named to fill the post of treasurer of the corporation, vacated by the death of Joseph L. Sturtevant. Mr. English will continue to serve as executive vice president.

Mr. English joined Sturtevant in 1947. He became executive vice president in October 1957.

Clemson

LeRoy Pike has been named associate chemist in the division of Fertilizer Inspection and Analysis at Clemson College, S. C. According to B. D. Cloaninger, director of the division, he will devote his time to fertilizer research methodology. Before coming to Clemson Mr. Pike taught chemistry and physics in the Gaffney, S. C. High School.

Freeport

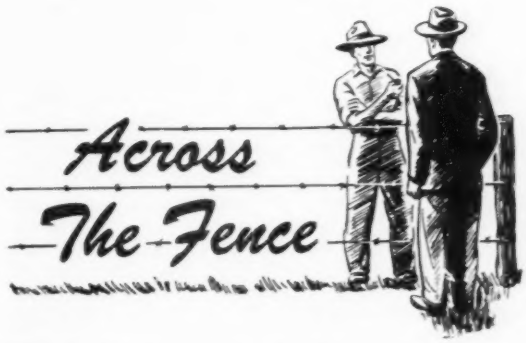
Charles A. Wight has been named president of Freeport Sulphur, succeeding Langbourne M. Williams, who continues as chairman and chief executive officer. Mr. Wight has been chairman of the executive committee, in which post he is succeeded by Pearson E. Neaman, who was senior vice-president and general counsel. He will continue the latter duties. Philip A. Lawrence has been made vice-president and controller.

C-I-L Subsidiary

Arnold Bullis has been appointed laboratory supervisor at the fertilizer plant of the William Stone Company at Ingersoll, Ont. In 1934 he joined the Canadian Fertilizer Company at Chatham which was acquired by C-I-L three years later. In his new position at Ingersoll he will be in charge of soil, fertilizer and feed analyses. The laboratory will also service the plant of the Witts Fertilizer Company at Norwich, Ont.

Commercial Solvents

Neal Van Kirk has been named general traffic manager of Commercial Solvents Corporation, it was announced November 25 by W. Ward Jackson, vice president.



research facts to help you sell

Split applications on early Number 1 potatoes in southwest Alabama bring up average yields materially, according to Alabama AES reports. Over a three year period tests on eleven plots show it pays to apply two thirds at planting and the other third a month later.

* * *

Deep-furrow planting helps take the hit or miss out of seeding arid rangelands. USDA reports this slows down drying in the seeded layer and retains moisture for germination and growth. Works for dryland wheat farmers, but the problem of retaining moisture is more critical in range seeding. They are still working on it, not ready for the technique to be generally adopted.

* * *

Instead of buying more land, fertilize and really work what you have, says the University of Minnesota. They cite, based on some pretty serious study that a 120-acre farm well fertilized can yield $3.70 per acre, while a lighter fertilizer program on a 160 acre farm will yield, net, only $2.67 per acre . . . and work harder for the extra $100 he finally puts in the bank . . . 350 hours harder.

* * *

200 bushels per acre is the goal of a farmer in Missouri. He has already pushed his corn up to 178.84 bushels per acre and is still not satisfied. Donald Ridings, the farmer in question is a Balanced Farming member. He used 300 pounds of N per acre to reach his present peak. Others in the same vicinity — Cape County—are doing mighty well, but not that well.

* * *

Since 1952 farmers have not done so well as in 1957 by making higher yields cut production costs . . . receiving more dollars per hour of labor. That's a report from the California Fertilizer Association. As net income rises, expense rises too, they mention—but expense goes up only about two-thirds as much as income. In California, they tell us, the average farmer who invests $500 in proper fertilizer can expect a net profit of $2500 to $3000 over and above the cost of the fertilizer and its application.

* * *

Weedy corn given a shot of extra N rapidly outdistances the weeds and goes on to yield about as much as clean corn without the extra N. So we learn from Iowa State College, where they have been testing this idea since 1954. Seems the corn makes better use of the nitrogen than the weeds do. Their tests have been with foxtail infestation.

'Round Table' Technical Talks Draw 350 from U.S., Four Other Nations

The seventh annual Fertilizer Industry Round Table attracted some 350 industry representatives and suppliers from the U.S., Canada, Cuba, Formosa and the Netherlands to Washington, D. C. November 5-7 for one of the finest technical programs ever assembled. Corporate investment—in time, expenses, etc.—was estimated to range up to about $10,000 an hour, and undoubtedly each representative who attended left with the feeling that his company's part in this investment would yield a handsome profit in know-how.

Sessions were built around three central topics: economics of preventive maintenance, economics of processing, and economics of formulation. In planning, the program was intentionally limited this year to allow more time for questions and discussion about each subject from the floor, and to afford more non-session time for members to talk over specific problems with participants after each adjournment. While the situation in this regard showed marked improvement, many of the speakers near the end of each session were forced to hurry through their discussions or to summarize them with the promise that the full presentation would appear in the published proceedings of the meeting.

Round Table Chairman Vincent Sauchelli, chemical technologist for National Plant Food Institute, announced that the committee—composed of himself, Housden Marshall of Olin Mathieson, Joe Reynolds of Davison Chemical, and Al Spilman of Fertilizer Manufacturing Coop.—was considering placing more emphasis on manufacture of pulverized fertilizers in the 1959 program, as granulation problems have been primarily stressed in each program since the inception of the conference. He invited everyone to submit questions along this line to be considered for the 1959 Round Table.

A bid to have the 1959 meeting held at Atlanta, Ga.—in an effort to attract a greater number of the small independent pulverized fertilizer manufacturers located in the Southeast—was voted down almost unanimously by the members (membership in the Round Table is acquired simply by attending the meeting and paying a very nominal registration fee, generally five dollars).

The general feeling of the group seemed to be that the perennial location at Washington offers good transportation from all areas, a wide choice of superior hotel and meeting-room accommodations, and pulls a better crowd than it would in another city.

Registration began on the evening preceding the conference and formal sessions got under way promptly the next morning. There were morning and afternoon meetings on Wednesday and Thursday, but Friday's two sessions were combined into one which lasted through the regular luncheon hour, to accommodate those who had afternoon transportation reservations leaving the city.

Members of the Round Table committee took turns as presiding through the meeting and each day's session was keynoted by a featured speaker who set the theme for that day's program.

E. I. duPont's Jesse C. Jessen keynoted the opening day's session with an illustrated talk on a preventive maintenance program.

Potash Company of America was host at a group luncheon after the morning session.

On the second day, W. F. Jacobi of Union Bag-Camp Paper Corp. presented a feature talk on packaging operations.

International Minerals & Chemical's Frank T. Nielsson keynoted the final day's meeting with a thoroughgoing analysis of formulation economics in terms of sales objectives and in-plant factors.

Questions submitted by members to the committee during the past year had been carefully screened, classified and organized, with one or more well-qualified participants on hand to shed some light on each one.

While space limitations prevent your editors from going even briefly into the content of each speaker's message, we are printing here a complete list of topics and names of each speaker. Any reader who has a specific question or wants information about one of the subjects can get an answer by simply addressing a letter or card to Commercial Fertilizer (see top of page 4 in this issue for our address). We will be glad to supply all possible data from the mass of notes we made at the convention, or to obtain more detailed information from the program participants.

Economics of Preventive Maintenance

What is a formula for balance between maintenance, labor cost and equipment replacement?—R. E. Robinson, Atlanta Utility Works; W. W. King, W. S. Tyler Co.; Allen S. Jackson, Fertilizer Equipment Sales Co.; Walter Sackett, A. J. Sackett & Sons Co.

Will the cost of a good preventive maintenance program be justified when it produces a minimum amount of "down time"?—Sam E. Shelby, Federal Chemical Co.; W. E. Schaffnit, Stedman Foundry & Machine Co.

What are the proven materials, available on the market today, to reduce corrosion in the ammoniator section of the production system? . . . What are the best designs for: belts, structural members, pipes, valves, hoppers, castings, and continuous weighing, as related to corrosion, ease of operation and maintenance?—J. R. Scrivenor, Omega Machine Co.

A discussion of preventive maintenance as relates to fast efficient means for cleaning granulation equipment such as the ammoniator, dryer, chute pulverizor, and so on.—group discussion from floor.

Will a dust collecting system pay in preventive maintenance and operation costs? . . . Discuss economics of a dust collection program throughout a fertilizer plant; that is, granulation system, elevators and shipping mills.—C. A. Hoffman, Wheelabrator Corp.; W. E. Foote, Dustex Corp.; F. A. Retzke, Smith Agricultural Chemical Co.

What are the economic advantages of temperature control of liquids in processing?—Albert Beehler, Fischer & Porter Co.

Discuss a volume displacement meter such as the Bowser stainless steel meter for handling nitrogen solution and phosphoric acid. Emphasize economics.—W. E. Jones, Northwest Coop. Mills; J. W. Doelling, Bowser Meter Co.

How do you calculate area-type flowmeter correction factors for a change of specific gravity?—Albert Beehler, Fischer & Porter Co.

What is a good method of adhering Teflon to metal?—J. W. Lewis, du Pont Co.

A discussion of instrument developments for the fertilizer industry—W. I. Strauss, Foxboro Co.

Economics of Processing

What equipment provisions can be utilized to prevent material from setting up on the interior of a cyclone-type dust collector? . . . Describe and discuss different types of air locks used on dryer and cooler cyclones.—group discussion from floor.

What is the possibility of drying at a lower temperature and increasing the retention time in a gas-fired dryer? . . . What cost advantages would this practice develop relative to fuel and electrical cost per ton? . . . How can a furnace be designed to reduce the potential for formation of fumes due to overheating fertilizer granules?—G. L. Bridger, W. R. Grace & Co.; George Lang, Edward Renneburg & Sons.

Is the use of steam economical in achieving granulation? . . . Can comparative cost figures or formulas be given? . . . What is needed equipment- and operating-wise to successfully use steam? . . . What process factors can cause failure in the use of steam?—T. J. Bosman, Federal Chemical Co.; T. R. Schmalz, F. S. Royster Guano Co.

A panel discussion of the advantages and disadvantages of wet and dry scrubbers with relation to efficiencies, particle size recovery capabilities, maintenance and investment costs.—E. L. Felch, American Agricultural Chemical Co.; D. E. Bonn, American Air Filter Co.; L. M. Leach, Indiana Farm Bureau Coop.

What control data should be collected by plant operators for the efficient operation of a granulation process?—Rodger C. Smith, Eastern States Farmers Exch.

A discussion of the economics of instrumentation as related to checking the air flow system through the dryer, furnace, cooler and other duct work systems.—D. E. Bonn, American Air Filter Co.

What are the important basic principles to consider in the selection of a new granulation plant?—Charles Major, Federal Chemical Co.

Can we save on operating costs and have a good condition material if we screened out only the fines finer than 24 or 28 mesh? . . . What is the cost of a given improvement in range of product

CF staff photos ——→

1. Standing: Albert Beehler, Fischer & Porter Co.; Bob Robirson, Atlanta Utility Works; Vincent Sauchelli, NPFI; Joe Prosser, A. J. Sackett & Sons Co.; Sam Shelly, Federal Chemical Co.; Al Henderson, Wilson & Toomer Fert. Co. Seated: Al Spillman, Fertilizer Mfg. Cooperative; W. E. Foote, Dustex Corp.; Wayne King,, W. S. Tyler Co.; F. A. Retzke, Smith Agricultural Chemical Co.; Bill Strauss, Foxboro Co.; Walter Sackett, A. J. Sackett & Sons Co.; C. A. Hoffman, Wheelabrator Corp.
2. Elmer Perrine, Nitrogen Div., Allied Chemical Corp.; Paul Castagno, Spencer Chemical Co.; Wayne King, W. S. Tyler Co.; Frank Nielsson, International Minerals & Chem. Corp., and G. L. Bridger, Davison Chemical Co. (standing).
3. Fred Neikirk, Central Chemical Corp.; George Urbanis, International Minerals & Chem. Corp.; Ed. Kingsbury, Kingsbury & Co.; Clair Dyer, Dale Chapman and Dick Falck, all with International Minerals and Chemical Corp.
4. Standing: F. A. Retzke, Smith Agricultural Chemical Co.; L. M. Leach, Indiana Farm Bureau; Seated: Frank Nelsson, International Minerals & Chemical Corp.; Joe Reynolds, Davison Chemical Co.; T. J. Bosman, Federal Chemical Co., and Rodger Smith, Eastern States Farmers Exchange.

particle size?–Frank T. Nielsson, International Minerals & Chem. Corp.

A discussion of the advantages and disadvantages of controlling all recycle portions returned to the ammoniator-granulator.–Al Henderson, Wilson & Toomer Fert. Co.; Rodger C. Smith, Eastern States Farmers Exch.

Should one use a batch or continuous production system? . . . What are the economics of continuous ammoniation compared with batch system ahead of dryer in granulation?–T. R. Schmalz, F. S. Royster Guano Co.; Rodger C. Smith, Eastern States Farmers Exch.

Indicate some economic relationships between equipment size, rate of production per hour, annual production capacity and per ton cost of production.–Paul Castagno, Spencer Chemical Co.

What are the advantages of applying suction to the classification screens? Cite actual experiences.–Frank T. Nielsson, International Minerals & Chemical Corp.; Wayne W. King, W. S. Tyler Co.

What are the principal techniques of ammoniation which contribute to efficiency of operation? . . . Since the amount of granulation achieved depends heavily on the ammoniator-granulator equipment, should not more attention be given to Sparger design, location and performance towards this goal rather than for the ease of maintenance, lower initial cost and replaceability?–Elmer Perrine, Allied Chemical's Nitrogen Div.

A discussion of the advantages and disadvantages of screening granulated mixed fertilizer between the dryer and cooler versus screening after the cooler.–G. L. Bridger, W. R. Grace & Co.; F. A. Retzke, Smith Agricultural Chemical Co.; L. M. Leach, Indiana Farm Bureau Coop.

A discussion of the economics in the selection of high capacity equipment versus low capacity equipment.–(James E. Madigan, Fertilizer Engineering & Equipment Co.: submitted written answer, as unable to attend.)

Discuss economic and qualitative advantages of a preblender-ammoniator-granulator.–Elmer Perrine, Allied Chemical's Nitrogen Div.

A discussion of the effect of re-cycle on raw material costs and factors which influence re-cycle rates.–S. D. Daniels, Monsanto Chemical Co.

← **CF staff photos**

1. Enrique Rife, Productora de Superfosfatos; Don Suverkoop and James Bonaventura, AFC, Inc.; Red Williams, Fertilizer Equipment Sales Corp.
2. Wm. F. Watkins, Olin-Mathieson; Dr. J. A. Chucka, Eastern States; Farmers Exchange, W. L. Garman, NPFI, and John Hardesty, USDA.
3. Joe Prosser, A. J. Sackett & Sons Co.; Gus Mautner, Baugh Chemical Co.
4. Stewart Daniels, Monsanto Chemical Co.; John Fletcher, U. S. Potash Co.; H. L. Beckman, La Plata Chemical Co.; Jerry Mitchell, National Fertilizer Co.
5. Daniel Walstal, American Cyanamid Co.; A. L. Phillips and A. V. Slack, both with TVA.
6. L. V. Clegg, Canadian Industries, Ltd., and Al Spillman, Fertilizer Mfg. Cooperative, Inc.
7. Bill Strauss, Foxboro Co.; F. A. Retzke, Smith Agricultural Chemical Co.; Dr. J. A. Chucka, and Rodger Smith, Eastern States Farmers Exchange.
8. Bob Heuerman, International Minerals & Chemical Corp.; W. R. Edgecomb, Arostook Fertilizer Co., George Urbanis, International Minerals & Chemical Corp.
9. Dick Powell, Mississippi River Chemical Co., and Willis Buie, Canada Packers, Ltd.
10. Joe Prosser, A. J. Sackett & Sons Co.; George Walton, Tennessee Corp.; John Shamp, U. S. Phosphorous Co.; Phillip Lanier, Tennessee Corp.
11. Lloyd Nusbaum, Harold Calvert, and Edward Carnell, all with Davison Chemical Co.; Dick Taylor, National Potash Co.
12. Bob Smith, Eastern States Farmers Exchange; Bob MacDonald, Potash Co. of America.
13. Harold Kreuger and Bill Schaffnit, both Stedman Foundry & Machine Co.; Grayson Morris, Fertilizer Mfg. Cooperative; L. A. Rhodes, Stedman Foundry & Machine Co.
14. Bob Hessel, Davisdon-Kennedy Co.; Sam Bushin, Consolidated Coop. Association; Jim Iliff, Davidson-Kennedy Associates.
15. Elroy Felch, Amer. Agric. Chemical Co.; Clair Hoffman, Wheelabrator Co.
16. A. V. Slack, TVA; Quentin Lee, Cotton Producers Assoc.; Clare Graff, Alabama By Products; Bob Heck, Southern Nitrogen Co.
17. Bill Badenoch and Dudley George, Richmond Guano Co.; Tom Bridgers, Farmers Cotton Oil Co.
18. Phil Turner, Du Pont; M. C. "Dutch" Suderman, Smith Douglass Co.; Bill Lewis, Du Pont.
19. Bert Tucker, Sohio Chemical Co.; John Surber and T. J. Bosman, both with Federal Chemical.
20. Dr. Vincent Sauchelli, NPFI; F. G. Keenen and J. C. Jessen, both with DuPont.
21. Albert Horner, F. W. Tunnell Co.; Arthur Mann and Walter Young, both with Ozark-Mahoning.

Economics of Formulation

What is the factor that establishes whether a formula is low or high analysis?–W. L. Hill, U.S.D.A.

What is the maximum ammoniation rate using anhydrous ammonia and the several phosphate materials? (phosphoric acid, triple, single) . . . What are the specifications, physical and chemical, for triple superphosphate to give good granulation?–Wm. W. Harwood, International Minerals & Chem. Corp.; T. E. Martin, U. S. Industrial Chemicals Co.; Barney Tatum, U. S. Phosphoric Products Div.

What is the formula usage, cost and use-availability of: diammonium phosphate, super phosphoric acid, phosphoric acid, calcium metaphosphate, triple superphosphate.–T. P. Hignett, Tenn. Valley Auth.

A discussion of the operational and quality aspects of the increased use of urea in ammonium nitrate – anhydrous ammonia solutions. Prior to 1957 practically no company making granulated fertilizer used a solution containing a mixture of urea-ammonium nitrate. What have our experiences been with the increased use of solutions such as Sohio's No. 16, No. 11, etc., in granulation?–Bert Tucker, Sohio Chemical Co.; Joe Reynolds, Davison Chemical Co.

Have any facts regarding the characteristics of potash for granulation been developed this year?–Richard Tayloe, National Potash Co.

What are the formula recommendations for good granulation of a 3-2-2 ratio material?–Elmer Perrine, Allied Chemical's Nitrogen Div.

A specific discussion of type of conditioners and their relative effect, that is, diatomaceous earth, kaolin and other similar coating agents as related to coating fertilizer granules of normal hygroscopic tendency.–discussion from floor & John Hardesty, U.S.D.A.

Can "spent" sulfuric acid be successfully used in a continuous ammoniator?–T. J. Bosman, Federal Chemical Co.

What are the basic principles and savings in choosing the correct nitrogen solution?–G. C. Marburger, Spencer Chemical Co.; C. E. Franklin, Phillips Chemical Co.

What are the cost relationships, tonnage requirements and equipment needs for special mixes including those containing minor element carriers or other additives?–Al Henderson, Wilson & Toomer Fert. Co.

Is it possible to successfully eliminate objectionable fumes from the continuous ammoniator's exhaust? . . . Are there any known methods of eliminating ammonium chloride, ammonium nitrate and ammonium sulfates aerosols from the exhaust fumes?–W. G. Mautner, Baugh Chemical Co.; Nicholas Post, Airkem, Inc.

Is there experimental information available where phosphoric acid is sprayed on top of bed? . . . What are the results on distribution and cleanup versus phosphoric acid sprayed under the bed?–T. E. Martin, U. S. Industrial Chem. Co.

How can a no or low nitrogen grade be formulated to produce a high quality, granular product economically?–A. P. Bailey, Moores Lime Co.

Can selection of raw materials help control process fumes and dust?–W. G. Mautner, Baugh Chemical Co.

What are the properties of dry ingredients which affect significantly the efficiency of mixing or granulation?–discussion from floor.

A discussion of the economics of phosphoric acid in fertilizer formulations.–Carl Schumacher, Monsanto Chemical Co.

Plants Have Social Relations

At the University of Minnesota they are conducting a major research into the question of how well different plants get along with each other. Rockefeller Foundation has granted $88,000 for a five-year study. It all started with the discovery that alfalfa does not do well on a field which has had previous quackgrass infestation.

Grounds Handbook by Landscape Man

Herbert S. Conover, landscape architect for New York Power Authority, developing the St. Lawrence Power Project, has written a book covering the wide field of the maintenance of grounds. "Grounds Maintenance Handbook" published by F. W. Dodge, New York, has 10 chapters, profuse illustrations, 503 pages and sells for $10.75.

Record Crowd Participates In Fertilizer Solutions Meeting

A record-setting crowd of more than 300 marked the annual convention of National Fertilizer Solutions Association at Cincinnati November 16-18.

The initial day of the proceedings was devoted to registration, a seminar on standards, a meeting of the directors, and visits to suppliers conference rooms. An air of serious interest in new products and methods prevailed in the conference rooms as manufacturers flocked to examine suppliers displays, and business sessions throughout the meeting were arranged to allow ample time for informal discussion and conference room study.

At the first business session on Monday morning Secretary George H. Serviss of Cooperative G.L.F. Exchange, Ithaca, N. Y. presided. President Richard Cecil of Cecil Fertilizer Service, Owensboro, Ky., opened the meeting with his report. He pointed out that the convention offered an opportunity to come together with your competitor and find out what he's been doing (. . . actually, you already know, he chuckled, but this is your chance to make him admit it).

Mr. Cecil said that progress of liquid fertilizers has been rapid enough that "the drys are beginning to know that the wets exist." He cautioned the members not to make the same mistake that anhydrous ammonia distributors had made: "don't cheapen your product for the sake of $3 a ton" by price-cutting.

The Association, he recalled, began as a small group who came together to discuss their many problems, and to bring their product into the open. The past year alone has brought in 68 new members and two additional nitrogen producers, he said, and of some 300 plants in existence last year, more than two-thirds are NFSA members.

The group's financial position has improved to the point that it can now undertake new activities, and expand these as additional funds come in.

Don Foster of Deshler Plant Foods, Deshler, O., chairman of the nominating committee, reported the recommendations of that group for new directors for five of the 12 U.S. and Canadian districts, and a new director from equipment suppliers. NFSA's directors, composed of 12 industry members and representatives of the equipment and chemical suppliers, elects the association's officers. (See separate item on this page for new officers, directors.) Mr. Foster pointed out that the new nominees, accepted unanimously, stressed representation of liquid complete fertilizer manufacturers, as the industry has taken a strong turn in that direction.

The remainder of the initial session was devoted to a presentation of "How Farmers Accept New Ideas and Problems" by Professors George M. Beal and Joseph Bohlen of Iowa State College. Most of CF's readers are familiar with the style and content of the Bohlen & Beal demonstration from the editorial treatment we have given it following previous presentations to other fertilizer industry groups.

In general, they characterized the innovators as larger farmers who have risk capital and many contacts outside their immediate community, and who are able to deal with abstract ideas.

The early adopters are generally younger men with high educational achievement, active in community affairs, and rather widely-read.

The early majority is characterized by a desire for social approval of neighbors, medium-high social and economic position, and usually relied on as informal leaders and advisors.

The majority is generally an older group than the preceding, has less social participation, and does less reading of mass media and agency reports; also they must have a direct sensory perception of results before adopting practices.

Laggards and non-adopters ordinarily have smaller farms, least education and social participation, and read little.

They traced and graphed the acceptance of a new idea by these five groups: how, when, and where they become aware of it (know its existence, but lack details), get information on it (obtain facts, see possibilities), evaluate it (give it a mental trial and weigh alternatives), try it (small scale experimental use), and adopt it (large-scale, continued use with satisfactory results).

They measured the time span during which the farmers went through these processes, and pointed out that the degree of complexity of the plan affects the rapidity with which it reaches almost complete acceptance.

For the most part, salesmen and dealers ranked pretty low as sources of information and advice at each stage, but made a fair showing in the trial and adoption levels.

Drs. Beal and Bohlen pointed out methods in which the time lag from introduction to general acceptance could be shortened. They stated, in response to questions, that—especially through the Midwest—fertilizer manufacturers needed a better level of salesman and dealers, trained to the point that they know appreciably more about their product than the farmer himself.

They suggested that the salesmen and dealers' status could be improved if they were established in

New NFSA Officers and Directors

PRESIDENT: O. L. Ohnstad, Ohio Liquid Fertilizer Co., S. Solon, O.
VICE PRESIDENT: Hugh S. Surles, Jr., Planters Cotton Oil & Fertilizer Co., Rocky Mount, N. C.
SECRETARY: Edward A. Wex, Badgerland Liquid Fertilizer Corp., Milwaukee, Wis.
TREASURER: John L. Wilson, Semo Liquid Fertilizers, Charleston, Mo.

NEW DIRECTORS

H. L. Johnson, Me-Jon Fertilizer, Oxford, Iowa
Dean R. McHard, Kaw Fertilizer Service, Lawrence, Kans.
Edward A. Wex, Badgerland Liquid Fertilizer Corp., Milwaukee, Wis.
Donald J. Humphrey, Flo-Lizer, Kingston, O.
August I. Balzer, Ok-Tex Chemicals, Lubbock, Texas
Joe Gillespie, Standard Steel Manufacturing Co., Indianapolis, Ind.

the community and active in civic affairs. On the plus side, they said farmers trust (and are more loyal to) men who are closer to them, and preferably operate a small farm of their own. In training these men, they urged an approach of fertilizer "programming" rather than just "selling."

This industry is in an enviable position, they concluded, because many farmers have improved their practices and management to the point where additional fertilizer represents the most profitable return on whatever capital they may be able to invest in improvements.

But, they cautioned, the follow-up with the customer at harvest time is a neglected tool. Here, on the spot where the results of this year's program are visible, is the place to outline next year's fertilizer program.

There was no afternoon on Monday; instead, suppliers conference rooms held open house.

Treasurer John L. Wilson of Semo Liquid Fertilizers, Charleston, Mo., presided at the Tuesday morning session, where Executive Vice President Ed Crouse of C. D. Liquid Fertilizer Corp., Liberty, Ind. led off with a report to the members. He said that the association's accomplishments in the past five years were outstanding, and that this teamwork in assembling and evaluating new ideas—especially in standards and production and inventory control—has saved individual plant operators a great deal in terms of time and money. The group effort will also help to outline a plan of development, he said, as the fertilizer manufacturer assumes a greater role in the farmers life and economy.

Dr. Samuel N. Stevens of Stevens, Thurow & Associates, principal speaker of the session, talked about the challenge to business leadership that our changing economic society presents. He said that selling has now become marketing, and this demands a higher-caliber, better trained representative, capable of advising the customer what to do, and when and where and how. Only now, he emphasized, are some farmers beginning to become businessmen rather than "miners of the soil," and a real opportunity exists for the aggressive fertilizer merchandiser to step into the picture. And unlike some industries, he said, the fertilizer industry is technologically and morally proper, and profitable to the customer. The criterion of whether it is a mature industry lies in whether it accepts its economy and moral responsibilities.

Iowa State College's Joe Bohlen and George Beal, well known in the fertilizer industry for their thoroughgoing study of farmers' adoption of new practices, were a highlight of the program at the liquid fertilizer meeting.

Dr. Stevens stressed the human factors in production and merchandising: more effective use of manpower, selection and training of sales and production personnel, and the relations of those workers to management, the machinery, and the product. In addition to careful selection, training, and administration, he urged a frequent re-evaluation of the company and its personnel.

In response to a question from the floor Dr. Stevens stated that farmer cooperatives in many instances—because of their size, nature and success—had come into direct competition with private industry . . . which raised a question in his mind as to the validity of their position: would they prosper if competing on an equal basis? While claiming to embrace the ideas of cooperation, he said that we should perhaps examine with some degree of care the evolvement of the cooperative movement, which originally filled a need in areas where competitive endeavor lacked, but has grown in many directions, and may not now fit the original need.

Scott Hall, inspector with the Indiana State Chemist's Office, was the final speaker on the morning session. He stated that liquid fertilizers had shown an increase annually in his state, but that the control office could see no effective method of handling liquid "custom mixtures," and therefore does not permit them. He described methods of sampling the various non-pressure liquid mixtures, and demonstrated a new piece of equipment now used to remove samples of liquids under pressure.

Citing some of the mutual advantages of cooperation between the fertilizer manufacturer and the control office, Mr. Hall expressed pleasure at the high-type industry that Indiana's fertilizer manufacturers had evolved.

The final afternoon session was chairmanned by Vice President William B. Parrish of Parrish Soil Builders, Auburn, Ill., who also served well as general convention chairman. This session a panel discussion on "Planning for Profits," moderated by Ed Crouse.

William W. Arnold of Allied Chemical's Nitrogen Division covered the topic of production equipment, and gave some good tips to the plant operators: consider the respective merits and requirements of air pressure versus pumps for moving liquid materials; keep informed of new developments and findings through reading trade magazines; use the technical service facilities offered by suppliers; arrange a new plant to allow for possible future modifications; carry an ample stock of spare parts; study the possibilities of new equipment; and consider something more than the original cost of equipment. Above all, he advised, don't be content with the present manufacturing techniques in an industry as new as this.

E. M. Chester of Schelm Brothers, Inc., discussing application equipment, cautioned against considering this machinery as an expense item alone. Good equipment, properly operated, gives a firm an atmosphere of efficiency that earns the prestige of satisfactory service—and repeat business. If you operate an applicator service, he said, it is especially important to keep your equipment in first-class operating condition to prove to the customer you can serve him properly . . . without having to stop the rig every

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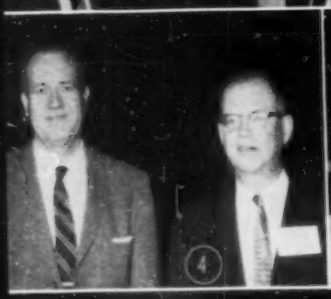
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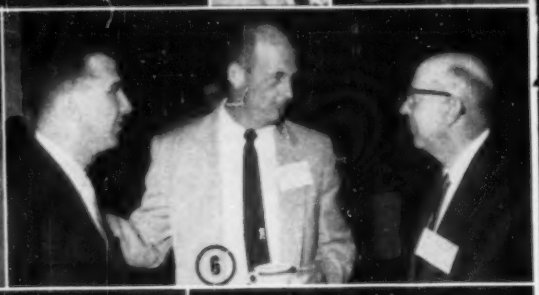
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couple of hundred feet to make a readjustment.

Monsanto's Stewart Daniels handled the subject of production and inventory control. While sales and prices are recognized as important, he said, production and inventory controls are often neglected — and can spell the difference between success and disaster in a season. Raw materials should be metered or weighed (1) on receipt, and (2) on input to processing; product should be measured at sale. A theoretical inventory of some sort should be maintained on these materials (inventory plus receipts less withdrawals), and confirmed by a physical inventory periodically, preferably monthly.

Scales and meters should be checked out at intervals by plant personnel after a pre-season checkup by the manufacturer's representative or qualified agent. The devices should be checked not at just one level, but through the entire range of use.

Production controls maintain a quality product, always on grade, and keep plant operation at a profitable level; in addition, they prevent equipment damage and material loss. Periodic laboratory analyses of product are a profitable investment, too, he added, as a final check on the efficiency of other production controls, and cited that 3000 tons of 8½-8½-8½ instead of 8-8-8 can cost a plant $6000.

Donald Weber of Spraying Systems reported on standards. The industry has almost a complete lack of uniformity; while surveys and conferences have brought out a general range of specifications, no appreciable degree of standardization has been evolved. He reviewed some of the merits and limitations of equipment, fittings and materials now in use, and urged the plant operators to work toward agreement in standards, for their own benefit as well as that of customers and suppliers.

After a "Dutch treat" cocktail party that evening, the annual banquet closed the convention. At the banquet President Dick Cecil presided and Michigan State University's Dr. James Hayes addressed the group.

Southeastern Fertilizer Conference Host To 400 In Atlanta

Attendance at the Southeastern Fertilizer Conference was greatly improved this year, as nearly 400 were attracted to the session sponsored by National Plant Food Institute in Atlanta, Ga. October 29-30.

A panel on the successful all-out fertilizer programs conducted in Hoke and Scotland counties, N. C., was one of the highlights of the program. Probing discussions of merchandising, soil testing, and the NPFI program in the Southeast rounded out the agenda.

J. H. Epting, chairman of the Southeast Industry Advisory Committee, presided at the conference.

Dr. Russell Coleman, executive vice president of NPFI, opened the program with a talk on the Institute's program in the area. He said the major roadblocks the farmers in the section must overcome are low per-acre crop yields and high merchandising costs.

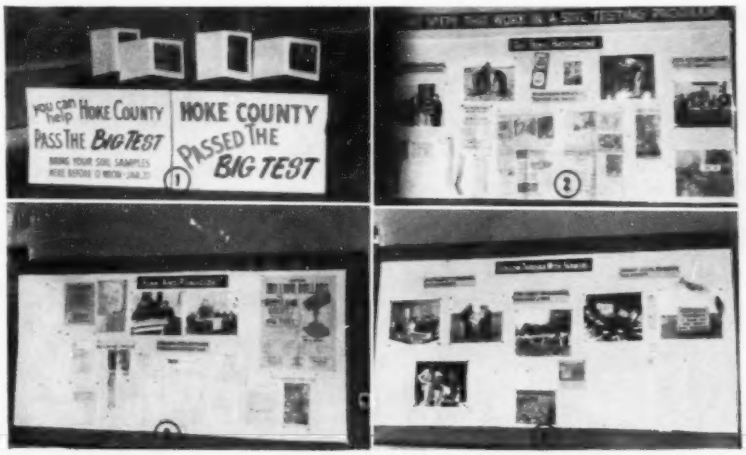
Dr. R. L. Beacher, Southwestern regional director of the Institute, stressed the need to bring soil testing into sharper focus in a fertilizer program. Admitting its limitations, he said that soil testing in its proper perspective can have an ever increasing value to farmers and to the industry.

The panel on "Acquainting North Carolina Farmers with their Fertilizer Needs" was moderated by Dr. J. W. Fitts, head of the Department of Soils at N. C. State College. W. C. Williford, Hoke County agent,

←——CF staff photos at Solutions meeting

1. W. B. Cannon and W. R. Harrell of Tidewater Chem. Co., St. Brides, Va.; R. Saunders Williams, General Metals, Inc.; and L. B. Wilkins, Tidewater Chem.
2. Kenneth Saalwechter, Bartlett & O'Bryan Fert. Co., Owensboro, Ky.; Dick Cecil, Cecil Fert. Service, Owensboro, Ky.; Scott Hall of the Indiana Fertilizer Control Office; and Dr. J. G. Hays, Michigan State Univ.
3. T. I. Martin, Na-Churs Plant Food Co., Marion, O., and Rosser L. Gwynn, Blount Fertilizer Co., Greenville, N. C.
4. Joe Stough, U. S. Potash Co., and O. L. Ohnstad, Ohio Liquid Fert. Co., S. Solon, O.
5. Glenn J. Faist of Elkton, William F. Lenhard of Georgetown and William Zurakowski of Bay Port, all with Wallace Morley Co. in Michigan; and Dan Koches, Standard Steel Mfg. Co.
6. Glen Jones, Allied Chemical's Nitrogen Div.; Loren E. Hopwood, Indian Point Farm Supply, Athens, Ill.; and Henry D. Troyer, Green Dew Farm Chem., Plain City, O.
7. Elmer Breedlie, B. T. McCulla and Thomas D. Cochrane of Crookston Liquid Fertilizer, Crookston, Wis.; Norman Dean Godden and Donald J. Humphrey of Flo-Lizer, Kingston, O.
8. Clarence Gutwein, Gutwein Ag. Service, Francesville, Ind.; Tom Stewart and Frank Walter, Deere & Co.; and Lewis Gutwein, Gutwein Ag. Service.
9. F. H. Kennedy, Potash Co. of America, and Bob Peine, Peine Grain Co., Minier, Ill.
10. Max Custer and Bill Middlesworth, Gro Mor Nitrogen Corp., Greentown, Ind.; and Robert L. Gatewood, C. D. Liquid Fert. Corp., Liberty, Ind.
11. R. T. Henry, Rainbow Chem. Tilbury, Ont.; Stanley Smith and Harry E. Rohlfs, R 'n' S Corp., Akron, Mich.
12. Duane Haas and Edwin Aylward, Aylward Fert. Co., Sullivan, Ill., and Ernie Harper, Allied Chemical's Nitrogen Div.
13. Don Foster, Deshler Plant Foods, Deshler, O.; E. M. Jones, Allied Chemical's Nitrogen Div.; and T. J. Horshall, Farm Fertilizers, S. Omaha, Nebr.
14. F. M. Chester, Schelm Bros.; Wayne Johnson, Johnson Bros. Mills, Shenandoah, Iowa; Robert A. Lemler, Allied Chemical's Nitrogen Div.; and Hugh Surles, Jr., Planters Cotton Oil & Fert. Co., Rocky Mount, N. C.
15. Jack Davis and Leslie D. Engler, Commonwealth Fert. Co., Russellville, Ky.; and Ed Crouse, C. D. Liquid Fert. Co., Liberty, Ind.
16. W. C. Calvert, Lafayette Farm Supply, Lexington, Mo., and Rusty Pisle, Sohio Chem. Co.
17. Ray Halker, Schumacher Soil Service, Columbus Grove, O.; Eugene A. Reichard and Clarence A. Reichard, of Robert A. Reichard, Inc., Allentown, Pa.
18. Howard Lathrope, Allied Chemical's Nitrogen Div.; Jake Jacobs, Tryco Mfg. Co.; and Dick Cecil, Cecil Fertilizer Service, Owensboro, Ky.
19. Art Aylward, Aylward Fert., Sullivan, Ill., and Bert Tucker, Sohio Chem. Co.

Displays at the Southeastern conference illustrated how the intensive county fertility programs were organized and carried out in Hoke and Scotland counties, N. C. They called for (2) getting people to participate, (3) planning and publicizing, and (4) following through with farmers.



told how the program had boosted fertilizer sales nearly 15% in the county despite a 40% cutback in acreage of cotton, the county's major fertilizer-consuming crop. T. B. Upchurch told how the Chamber of Commerce aided in the Hoke County effort.

W. M. Campbell of Dixie Guano Co., Laurinburg, and Clyde Stutts of Commercial State Bank, Laurel Hill, told of the plans developing in Scotland County to raise farm income—and fertilizer sales—in the 1958-59 crop year.

Through cooperation of businessmen, 75 soil sample pick-up stations were spotted through the county and more than 3000 samples were turned in, representing some 75-80% of the cropland. More soil analyses have been made there than the total for the four preceding years.

Mr. Stutts said that bankers used to consider a farm loan in terms of how and to whom they could sell the property in the event of a foreclosure, but now are tending to consider the past crop-production record, management, and potential of the land itself as a better credit criterion.

Final speaker on the program was F. E. Hartzler, merchandising specialist from Kansas State Teachers College. He accused the fertilizer industry of wanting someone else to do all its work, and stressed that the industry must do its own merchandising if it wants to approach the real potential that exists. Price merchandising (poor pricing) is poor business, he said, and fertilizer producers are going to have to do a good hard selling job, placing more stress on dealer training. Dealers, he added, are getting about all they can out of farm equipment and seed sales, so a real opportunity awaits them if they push fertilizer sales.

Establishing industry averages to use as a yardstick of individual efficiency is essential if the smaller plant is going to survive, he stated, and will help to evolve a set of sound business practices that will work in each region. Furthermore, he continued, good bookkeeping practices are a "must" to establish real costs, and the manufacturer must know his costs if he is going to compete successfully. Five years of break-even operation, he cautioned, can put a firm out of business.

In closing, Mr. Hartzler urged that fertilizer selling practices probe beneath the surface and get at the farmer's basic desires. Increased yields can mean many things besides more income and better efficiency to different farmers, he pointed out; the basic motives of improved standing in the community and praise of neighbors (especially the women-folk) can stimulate a farmer to fertilize more and boost yields when a simple economic profit is only a minor stimulus. After all, he concluded, the subconscious motivation is much stronger than the reasoning mind.

Advisory Committee

Preceding the conference, the Southeastern Industry Advisory committee met and heard Dr. Samuel Tisdale, Southeastern regional director for NPFI summarize current activities and outline plans for projects to be undertaken during the coming year. These included expansion of community projects to emphasize soil testing and farm demonstrations, increased cooperation with bankers and their organizations, and stepped-up research projects.

Laurence C. Walker, NPFI chief forester, reported meeting with more than 100 groups interested in forestry research in the area, while developing plans for the Institute's program in this field.

J. H. Epting of Epting Distributing Co., chairman of the committee, appointed Howard Parker of Sylacauga Fertilizer Co., to act as program chairman for the 1959 Southeast conference, and L. D. Hand of Pelham Phosphate Co. and Tom Bridgers of Farmers Cotton Oil Co. to assist Mr. Parker.

Southeast Conference Pictu e

1. C. Dale Hoover, Mississippi State College; J. W. Fitts, North Carolina State Colle_e, and Joe Culpepper, Spencer Chemical Co.
2. Ralph Boynton, U. S. Potash Co.; W. M. Campbell, Dixie Guano Co., and M. S. Williams, NPFI.
3. Sam Tisdale, NPFI; F. E. Hartzler, Merchandising Specialist, Kansas State Teachers College; Dallas Cantwell, Southern Nitrogen Co.; W. R. Alstetter, NPFI.
4. Bryant Cooper, Home Guano Co.; Leroy Donald, Monsanto Chemical Co.; Gordon Cunningham, Tennessee Corp.

Midwest Meeting Slates Four Features

Four major program features are planned for the 11th annual joint meeting of Midwestern agronomists and fertilizer industry representatives sponsored by National Plant Food Institute at Edgewater Beach Hotel, Chicago, February 12-13.

The program will center around: (1) fertilizer research reports by soils specialists from five Midwestern agricultural colleges; (2) a study of the fertilizer sales potential in the Middle West; (3) A summary of experience with NPFI crop production potential programs in Illinois, Wisconsin, Minnesota and Kansas; (4) reports by Midwest district representatives of NPFI educational program highlights in their States.

Dr. W. P. Martin, University of Minnesota, will be chairman, and Dr. George E. Smith, University of Missouri, co-chairman.

Members of the industry are advised to make early arrangements for room reservations at the Edgewater Beach Hotel.

Arkansas Will Host Southern Officials in '59

Southern Feed and Fertilizer Control Officials will hold their seventeenth annual convention at the Velda Rose Motel in Hot Springs, Ark., next June 9-10, it was announced by Bruce Poundstone, secretary-treasurer of the group.

MARKETS

ORGANICS: Current demand for fertilizer organics is in excess of supply, maintaining the market in extremely tight position. All producers of leather nitrogenous tankage are sold up for the foreseeable future at prices ranging from $3.25 to $4.50 per unit of ammonia, bulk, f.o.b. shipping point.

SEWAGE SLUDGE: All major productions continue in a sold up position for the season ending June 1959. Price of a major production is $3.10 per unit of ammonia, and 50¢ per unit of APA, bulk, f.o.b. midwestern shipping point, with an advance of 25¢ per unit of ammonia schedule for January through May.

CASTOR POMACE: Current market on domestic material is $35.00 to $36.00 per ton, in bags, f.o.b. middle Atlantic shipping point for March/April shipment. Producers are fully booked prior to March. Imported material where available is indicated at around $5.00 per unit of ammonia, in bags, at southeastern ports.

DRIED BLOOD: Unground sacked blood is indicated around $5.50 per unit of ammonia in the New York area, and around $6.00 around Chicago.

POTASH: Deliveries of domestic and imported potash in the United States, Canada, Cuba, Puerto Rico, and Hawaii during the first months of 1958 were 1,522,540 tons of K_2O, 3% higher than the same period last year. Prices continue steady and unchanged from announced season's schedules.

GROUND COTTON BUR ASH: This type of potash, primarily in the form of carbonate of potash, testing 38 to 40% K_2O, continues heavily committed for the balance of 1958 with limited supplies available for January through June shipment, at prices approximating the delivered cost of domestic sulphate of potash for most destinations.

SUPERPHOSPHATE: Stocks continue in adequate proportions for season's current needs, and prices are firm and steady. Movement is picking up.

AMMONIUM NITRATE LIMESTONE: During October, a major domestic producer and importers announced a downward adjustment in price effective October 1st to the current basis of $44.50 per ton in bags f.o.b. middle Atlantic production point and at usual Atlantic and gulf ports. Bulk price is $4.00 per ton less.

SULPHATE OF AMMONIA: Production generally continues heavily sold for the current season at prices ranging from $32.00 per ton bulk for coke oven type to $35.00 per ton for granular synthetic material, f.o.b. origin. Port prices on the Atlantic coast vary from $36.00 to $39.00 per ton, bulk, f.o.b. cars.

NITRATE OF SODA: Prices of Chilean nitrate of soda recently were reduced to $44.50 in 100 lb. paper bags, and $40.50 bulk, f.o.b. Atlantic gulf ports, effective October 1st.

GENERAL: Prices of most fertilizer materials, with the exception of certain nitrogen materials, which have been reduced, are generally at steady levels. Potash prices are seasonally advancing, according to previously announced schedules. General mixing activity is increasing at the present time.

——ANNOUNCEMENT——

Official Publication No. 12 issued by the ASSOCIATION OF AMERICAN FERTILIZER CONTROL OFFICIALS will be available for distribution at $2.00 per copy (discounts in lots of 100 or more) December 15, 1958, through the office of Secretary-Treasurer, B. D. Cloaninger, P. O. Drawer 392, Clemson, South Carolina.

The publication includes official definitions of all fertilizer terms, grouped by principal plant food ingredients, names, addresses and telephone numbers of all Fertilizer Control Officials, and papers of those who appeared on the program.

Send check or money order to the Secretary-Treasurer, P. O. Drawer 392, Clemson, South Carolina, with complete mailing instructions. Money will be promptly refunded if not satisfied with the publication.

CF-Staff Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

	October		September		July-Sept. Qtr.		January-June		July-December		YEAR (July-June)	
STATE	1958	1957	1958	1957	1958	1957	1958	1957	1957	1956	1957-58	1956-57
Alabama	.....	53,326[1]	53,879	38,695	90,652	76,674	734,062	808,901	172,721	174,713	906,783	983,614
Arkansas	12,171	9,867	13,570	15,346	42,100	44,923	226,889	265,235	62,752	59,915	289,641	325,150
Georgia	50,207	45,797	15,206	18,128	107,373	100,432	944,618	980,824	269,529	253,559	1,214,417	1,234,383
Kentucky	.....	30,666[1]	22,624	21,502	38,396	38,972	435,023	444,107	88,771	90,284	523,794	534,391
Louisiana	17,031	16,870	13,650	10,638	29,933	31,773	232,743	200,277	64,192	71,129	296,935	271,406
Missouri	113,535	88,955	105,951	109,201	164,296	188,293	420,615	460,487	335,312	331,343	755,927	791,830
N. Carolina	.....	70,631[1]	49,929	34,293	89,602	72,305	1,261,685	1,300,353	199,446	216,234	1,461,131	1,516,587
Oklahoma	.....	17,213[1]	29,273	20,489	43,410	29,832	55,964	52,836	51,436	54,509	107,400	107,345
S. Carolina	34,630	28,212	29,006	23,822	58,100	48,486	615,733	694,571	116,874	122,929	732,607	817,500
Tennessee	.....	30,250[1]	.....	34,696[1]	.....	69,431[1]	307,182	383,457	135,717	141,181	489,668	524,668
Texas	52,136	50,088	45,298	42,746	103,794	109,118	452,327	392,770	213,801	202,406	666,128	595,176
California	(reports compiled quarterly)				.....	216,479[1]	679,577	663,484	443,658	416,264	1,123,235	1,079,748
Virginia	(reports compiled quarterly)				76,031	74,379	549,773	600,158	140,783	154,075	690,556	754,233
Indiana	(reports compiled semi-annually)						795,506	781,268	284,959	305,917	1,080,465	1,087,185
New Hampshire	(reports compiled semi-annually)						16,053	15,730	3,966	3,253	20,019	18,983
TOTAL	279,710	241,789	378,386	334,860	843,687	815,187	7,886,039	8,154,700	2,661,415	2,653,420	10,594,220	10,808,120

..... (not yet reported) * Not compiled [1] Omitted from column total to allow comparison with same period of current year.

Equipment News Roundup . . . .

Automatic Weighing-Filling

A new automatic bench model weighing and filling machine keeps production moving swiftly and raises operator efficiency during packaging operations, Richardson Scale Co. has announced.

The new Richardson unit, called the Holm Model SS Weighing And Filling Machine, provides 18 to 20 accurate weighings per minute of free, semi-free, and non-free flowing materials, with maximum capacity of 12½ lbs. The unit is completely automatic. For full information, circle Number 55 on CF's Information Service Card on page 55.

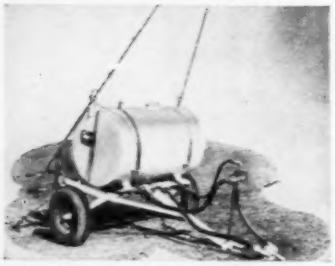
New Conveyor Idlers

An expanded new line of belt conveyor idlers has been introduced by Link-Belt Company. Offered in five series and in widths ranging from 14 in. to 84 in., the new line increases the number of idler variations the company manufactures from 38 to 64. In all, the new line includes more than 630 different types and sizes.

The five series of idlers, designated as Series 5000 through 9000, make possible the exact matching of idlers to specific operating requirements of all belt conveyor applications, and represents the culmination of years of experience in idler design and production.

For details of all series circle Number 56 on CF's Information Service Card on page 55.

Liquid Fertilizer Application



Tryco Manufacturing Company, has worked directly with Liquid Fertilizer Manufacturers for several years in the development of application equipment. Realizing that the men who use the machine should dictate its features, Tryco followed their suggestions and combined their ideas. Simplicity, large capacity, low cost and versatility keynotes the 1959 models.

The basic unit is a heavy duty trailer. To obtain the proper combination of equipment which will correctly apply the liquid being used. Tryco offers steel or aluminum tanks, pumps or compressors, stainless steel booms for top dressing or tool bars for side dressing.

Pictured here is a trailer sprayer with 300 gallon steel tank, 1½" PTO pump system and 33 foot stainless steel boom assembly.

For descriptive catalog sheet circle Number 57 on CF's Information Service Card on page 55.

Air Filter

A completely new air-line filter uses an interchangeable "throw-away" type filter cartridge. Cartridges are self-contained cylinders made from helically wound ribbons of phenolic resin impregnated cel lulose, electrically fused together and is unaffected by most liquids and gases.

The air enters the filter and passes through a directional flow chamber which creates a cyclonic separating action within the plastic bowl.

Dirt, grit, condensate and other foreign matter is automatically separated from the air stream and forced to the bottom of the bowl where it is trapped by a brass baffle. The residue is easily blown out by simply opening the blow-off valve.

Air, thus cleaned, passes thru the filter cartridge where a second cleansing process removes all remaining particles within a 40 micron rating.

For Bulletin, circle Number 58 on CF's Information Service Card on page 55.

Convertible Lift Truck

The all-around handling features of the Kwik-Mix model S-10 "Moto-Bug" are the subject of a new four-page bulletin just released. Illustrations show how the one "Moto-Bug" unit can be easily converted from fork lift to drum handler, platform carrier, utility scraper and 10 or 15 cu. ft. capacity hopper carrier. For your copy of this bulletin, circle Number 59 on CF's Information Service Card on page 55.

Walkie Truck

The operational features that make the "Transporter" walkie-type truck, manufactured by the Automatic Transportation Company, ideally suited for work in highly congested areas for short hauls or intermittent operations, are illustrated in a new 16-page color booklet entitled "Transporter Facts and Factors."

Copies of the "Transporter Facts and Factors" booklet are available if you will circle Number 60 on CF's Information Service Card on page 55.

Approved Respirator

The first plastic respirator for protection against dusts, pneumoconiosis-producing mists and chromic acid mists, with Bureau of Mines Approval 2175, is announced by Welsh Manufacturing Company.

Weighing only 2.1 ounces, approximately half that of other leading respirators, the Welsh 'Air-Raider' introduces a new respirator design providing greater functioning filter area which increases filter life. Unique valve construction and location reduce inhalation and exhalation resistance. For details, circle Number 61 on CF's Information Service Card on page 55.

Graphic Control Panel

The Barnard & Leas Mfg. Co., Inc., of Cedar Rapids, Iowa, announces the addition of a Graphic Control Panel as standard equipment on the B & L Autobatch and the B & L Autobatch Skid Plant line of liquid fertilizer equipment.

The versatility of this panel provides remote control and operation of various components together with visual indication of the sequence involved.

The routing of finished products and raw materials to and from storage and load-out is by means of dependable electrical controls. Setup is plainly and instantly visible due to neon indicators located in the flow diagram on the panel. This provides "centralized" routing of all materials involved.

This graphic control panel is applicable to both dry and liquid materials and combinations there-of.

For more information circle Number 62 on CF's Information Service Card on page 55.

New Gearmotors

The Lima Electric Motor Co., Inc., has announced the addition of a complete range of sizes of Gearmotors to their present line of "Selective-Speed" Lima Gearshift Drives and Industrial Electric Motors.

Called the Lima Gearmotor, this new line consists of single, double and triple reduction units, integrally motor mounted, with Duti-Rated Lifetime Gearing. Motor capacities are rated from 1 to 125 hp, with output reduction speeds from 780 to 7½ rpm . They are adapted for horizontal foot mounted applications.

For complete information on Lima Gearmotors, circle Number 63 on CF's Information Service Card on page 55.

New Bulk Material Conveyor

A new bulk material conveyor elevator, called the "V" Series Buck-el, was recently announced by The Bucket Elevator Co. It features ease of cleaning made possible by an exclusive cantilever design. This permits complete removal of casing covers, pulleys and belting without disturbing bearings, mechanical seals or operating machinery.

Available in stainless steel, carbon steel, galvanized steel or a combination of these materials, the new "V" Series Elevator is offered in five basic sizes. Capacity range of these sizes is from four to forty cubic feet per minute. For full description of features, circle Number 64 on CF's Information Service Card, on page 55.

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Equipment News . . .

New Meters For Liquids

A new line of Metal Tube Rotameters has just been introduced by Schutte and Koerting Company. These Rotameters are designed for service with hazardous and high pressure fluids at temperatures up to 400° F. The rugged design of these instruments fits them for flow measurement jobs with the hard-to-handle fluids found, particularly, in the chemical, petroleum, and power industries.

Designated as Fig. 1900-F Metal Tube Rotameters, these instruments are available in a variety of sizes which, for water, provide capacity ranges of 0.24 gpm to 2.4 gpm for the smallest Rotameter and a range of 10 gpm to 100 gpm for the largest.

The Rotameters are described in a bulletin which includes simplified easy-to-follow instructions for sizing the Rotameters for liquid service. For your copy, circle Number 65 on CF's Information Service Card on page 55.

Fertilizer Pump Bulletin

A new bulletin covering pumps for fertilizer and for temperature controlled liquids has been issued by Dean Hill Pump Co.

The pump for temperature controlled liquids, such as sulphur, incorporates a steam-jacketed line shaft and discharge column to assure a continuous free flow. Bearings and shaft damping bushings are lubricated by the liquid itself.

For free bulletin, circle Number 66 on CF's Information Service Card on page 55.

Pallet Handbook

Can you identify all the popular styles of pallets? Do you know the labor saving advantages of unit load handling? Are you familiar with the use of air rights and the space saving benefits of narrow aisles in your warehouse?

All these questions and many more are answered in a new 24 page handbook "Pallet Handling in Narrow Aisles" now being distributed by The Raymond Corporation.

For a free copy, circle Number 67 on CF's Information Service Card on page 55.

Automatic Chemical Analysis

The Technicon AutoAnalyzer, a new system for continuous automatic chemical analysis, that can detect trace materials down to parts per billion, with an accuracy of 1%, is announced by Technicon Controls, Inc., Chauncey, New York.

By automating each step of a chemical analysis now performed manually; i.e., measuring, mixing, purifying, processing, comparing and recording, and integrating them into a continuous flow system, the AutoAnalyzer provides accurate, dependable analysis with exact reproducibility. In the laboratory, this robot chemist runs twenty, forty, or sixty tests per hour without human supervision; tremendous economies are achieved.

For further information, circle Number 68 on CF's Information Service Card on page 55.

Portable Pneumatic Conveyor

Development of a trailer mounted, portable, combination positive and negative pressure pneumatic handling system has been announced by Sprout, Waldron & Company, Inc. The new unit, part of the company's line of Pneu-Pac equipment, is said to have unlimited possibilities for in-plant handling of granular free-flowing materials.

Specific capacities for handling a variety of chemicals, plastics, foods, feeds and similar dry, free-flowing materials can be quoted on request. Design data is given in advance specification sheet 205, for copy of which, circle Number 69 on CF's Information Service Card on page 55.

New Pressure Type Fans

A new line of pressure type tubeaxial fans for use in industrial applications has been developed by Propellair, Springfield, Ohio. Supplementing present designs, these new fans may be used to handle air, fumes, and light dusts generally encountered in industry or in special machining operations.

Designated as Propellair Type DT, the new fans are equipped with matched design motors and propellers, both of which are products of the same manufacturer, thus carrying a single nameplate guarantee. There are available with propeller diameters of 8, 12, 16, 20, and 24 inches; sizes through 60 inches are now under development.

For additional information, circle Number 70 on CF's Information Service Card on page 55.

Sulphuric Process

Now being actively promoted in the United States is the Kachka Roff-Guareschi Sulphuric acid process, now being used successfully in England and Italy. This process is claimed to be a substantial improvement over the chamber process for making sulphuric acid.

A technical paper in a British journal (Chemistry and Industry, 1958) reports the South Eastern Gas Board has operated a plant using the K-G proces at East Greenwich, England, and finds a 15% less production cost than their adjoining acid plant using the chamber process.

Licensing of the K-G sulfuric acid process is available. For full information circle Number 71 on CF's Information Service Card on page 55.

New Oven For Chromatograms

A new drying oven for use in paper chromatography has been developed by New Brunswick Scientific Company. Paper chromatography offers a method of separating and analyzing, on filter paper, of minute quantities of organic or inorganic compounds — a laboratory technique that is finding increased application in industrial control procedures and research.

Engineered to provide the utmost in convenience and dependability, this equipment . . . Model CD . . . combines the advantages of full-view color development, compactness of size, and moderate cost.

For full information, circle Number 72 on CF's Information Service Card on page 55.

Trailer Spreader

Fertilizer dealers can make more use of their liquid application equipment by the addition of the new Simonsen tractor-drawn Trailer Spreader, now available from Simonsen Manufacturing Company.

He can simply replace his nurse tank with the new Simonsen unit for a couple of months of dry fertilizer spreading before the liquid season starts.

In the case of a dry fertilizer dealer, the Trailer Spreader will enable him to begin operations earlier because he can get into the fields with this unit behind a tractor under conditions where a truck spreader couldn't operate.

Specifications and price information on the new Trailer Spreader may be obtained by circling Number 73 on CF's Information Service Card on page 55.

Materials News . . .

New Formulation Pad

A new fertilizer formulation pad, particularly suited as a guide for using "Uramon" ammonia liquors, has been issued by the Du Pont Company's Polychemicals Department as an aid to fertilizer manufacturers.

The inside cover of the pad contains pertinent information such as composition of fertilizer materials, ammoniation rates of phosphates, miscellaneous conversion factors, and water content of fertilizer materials. These data can be used for calculating the fertilizer grade desired when using the four UAL solutions—UAL-A, UAL, UAL-S and UAL-37.

The pad, measuring nine and a quarter by 15 inches, contains 100 detachable pages for compiling data. Tops of the pages are punched for filing purposes. For your copy, circle Number 74 on CF's Information Service Card on page 55.

Chemical Burn First Aid

Neutralize, a buffering solution developed a few years ago by the E. D. Bullard Company, has a new package to make it more convenient and available for people working with acids or alkalies. This is a phosphate buffer that inactivates effects of chemical irritants in the eyes and on the skin. A relatively small quantity of Neutralize counteracts either acids or caustics.

To alert employees requiring first aid for chemical burns, a new Chemical Burn Station has been developed, composed of a large plastic backboard and a container for a 32 ounce bottle of Neutralize which attaches to any wall surface. For full information, circle Number 75 on CF's Information Service Card on page 55.

Safety Section meets in chicago

At the Fertilizer Section meeting of the National Safety Council at the LaSalle Hotel in Chicago, October 20-21, **General Chairman George Dietz, Fertilizer Manufacturing Cooperative, Baltimore,** gave a very fine report of the Section's activities during the past year. He was proud to point out that the industry had made progress in accident prevention and told the group that the number of reporting companies got through "the spring season" with a very much better frequency rating than ever before. In 1955, 173 reporting companies had a frequency rate of 17.27. In 1958 (January-July), 172 companies reported a rate of 7.94.

Briefly highlighting the year's activities and committee reports, Chairman Dietz told about the fine start that had been made in setting up the Section's five accident training school and said that the ground work had been laid for bigger and better schools in the future. The fertilizer industry is still the highest in severity and second highest in frequency of all the chemical industries, so much work is to be done to improve.

W. C. "Billy" Creel, Safety Director, North Carolina Dept. of Labor, Raleigh, in a short talk to the group, stressed the need for accident prevention supervisory training in the industry, and pointed out the benefits to be obtained by fertilizer plants through active participation in the accident school program. He, and **Paul Truitt,** of **NPFI,** worked together to get the program set up.

John E. Smith, Safety Director, Spencer Co., Pittsburg, Kansas, in a talk about accident reporting and analysis, said that you could really flounder around without a good accident reporting system, but that you could always approach top management when you have a good factual report to present to show how your safety program can save money. In most cases then, top management will go along with you in backing your program.

But it is best to keep your presentation as short and quick to grasp as possible. Keeping them readable helps, too. Be sure to show frequency and severity figures so that improvement or lack of it can be seen instantly. Also comparative figures are helpful to show what other companies are doing and how your company compares with them.

When your reports show, for example, a high frequency eye accident rate, you can get immediate action from management to do whatever is necessary to correct the situation. Off-the-job accidents are three to one above those in the plant, so safety educational programs work to reduce off the job accidents as well as on the job accidents. Accident cost records are an important part of safety work. (Incidentally, medical costs have doubled in the past ten years.) But there is no use in keeping accident records unless you use them to reduce accidents.

Dr. John H. Foulger, Director of Medical Research, E. I. Du Pont de Nemours & Co., Wilmington, Del., in discussing the so-called accident-prone individual, said there is nothing in any study that shows so-called accident prone people (victims of multiple accidents) necessarily continue to be accident prone. Instead, a careful study showed that fatigue, shock, anger, frustration, lack of sleep, too much golf, elbow-bending, overwork, etc., all affected a man's condition as measured through blood pressure, and that stresses of all kinds as registered in high blood pressure, lead to accidents. An accident situation and a vulnerable person can result in an accident. Accidents are primarily

1. Mike Ellison, Protection Supvr., Mississippi Chemical Corp., Yazoo City, Miss.; Bill Stone, Supt., Wilson & Toomer Fert. Co., Jacksonville, Fla.; John Mark, Prod. Mgr., Farm Bureau Coop. Assn., Columbus, Ohio; C. S. Griffith, Virginia-Carolina Chem. Corp., Cincinnati; J. L. Shopen, Safety Dir., Consumers Coop. Assn., Kansas City, Panel Moderator; Gaither T. Newnam, Mgr., Insurance Dept., Smith-Douglass Co., Norfolk; Grayson Morris, Coop. Fertilizer Service, Richmond; Stratton M. McCargo, Personnel Supvr., G. L. F. Soil Building Service, Ithaca. A. I. Raney not shown.
2. Paul T. Truitt, National Plant Food Institute, Washington; W. C. Creel, Safety Dir., North Carolina Dept. of Labor, Raleigh; Stratton M. McCargo, Personnel Supvr., G. L. F. Soil Building Service, Ithaca; John Smith, Safety Dir., Spencer Chemical Co. Pittsburg; Quentin Lee, Cotton Producers Assoc., Atlanta.
3. Dr. John H. Foulger, Dir., Medical Research, E. I. Du Pont de Nemours & Co., Wilmington, Del.; Vernon Page, Chief Engineer, Sohio Chemical Co., Lima; John E. Smith, Safety Dir., Spencer Chemical Co., Pittsburg, Kans.; W. C. Creel, Safety Dir., North Carolina Dept. of Labor, Raleigh, and George F. Dietz, Safety Dir., Fertilizer Mfg. Coop., Inc., Baltimore.

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the failure of the person rather than the equipment.

To give his report on Safe Practices In Handling Ammonia And Nitrogen Solutions, **V. C. Page, Sohio Chemical Company,** wrote letters to about 75 plant superintendents, asking for factual information on accidents and failures that they had experienced in handling operations.

Only a very few companies reported no serious accidents or failures. Without counting those accidents and failures of a minor nature, a total of 32 serious cases were reported. Two of these resulted in deaths; all the rest resulted either in serious burns or a considerable loss of product.

Of all the accidents reported, over 50% of them resulted from faulty manipulation of valves and fittings.

Two accidents, one resulting in a death, occurred when anhydrous ammonia was confined in a hose between two closed valves, without any relieving device. As the product warmed up, pressure increased, and the inevitable happened. Three cases resulted from opening the wrong valve, presumably due to not checking the "line-up" before cracking the valve.

In another similar case, the solutions pump was started while another man was checking the sparger pipe. Unless you can see the entire run of a line, don't cut-in until you assure yourself that it's O.K.

Another group of failures occurred as a result of what we might describe as "Fitting tappers." In one case, a seeping safety valve was tapped—and it came fully open. In another case, the operator did not believe the reading of the sight glass of his ammonia drum and tapped the gage glass connection; fortunately he was a fast runner and was uninjured.

ELECTED FOR 1958-59

Officers—Chairman: George L. Pelton, Personnel Mgr., The Smith Agricultural Chemical Co., Columbus 16, Ohio; Vice Chairman: Elmer C. Perrine, Technical Rep., Nitrogen Division, Allied Chemical Corporation, New York, N. Y.; Ansel I. Raney, Safety Director, Phillips Chemical Company, Bartlesville, Okla.

Executive Committee (for 3 year terms): W. C. Creel, Safety Director, State of North Carolina, Department of Labor, Raleigh; George F. Dietz, Safety Director, Fertilizer Manufacturing Cooperative, Inc., Baltimore; John S. Mark, Production Mgr., Farm Bureau Co-op. Association, Columbus, Ohio; George L. Pelton, Personnel Mgr., The Smith Agricultural Chemical Company, Columbus 16, Ohio; Yen Shen, Taiwan Fertilizer Company, Taiwan, China; W. A. Stone, Plant Manager, Wilson & Toomer Fertilizer Company, Jacksonville, Fla.

Two other serious cases in this area resulted directly from trying to effect repairs while the lines were under pressure; in one case, a leaky union was tightened with a pair of pipe wrenches, until the union failed.

We are all prone to make stop-gap repairs in order to stay on stream. We will always do this. However, in the four preceding cases, the men did not take time out to get proper safety equipment and take proper safety precautions compatible with the possible results of their action.

Several letters reported accidents due to disconnecting hoses without first venting off pressure. There are several situations where we can ask for trouble here; for instance, sending just one man to unload a tank car, particularly if he is not well experienced. Also, those cases where we know we have a leaky valve system that can not be completely shut off. Then there are those cases where we "crack the joint a little bit and let her bleed down." Going a step further, what about those cases where the discharge from the vent is not carried sufficiently far away or is pointed in a direction where a second party can be injured?

In the general area of fitting failures, we should also include those failures due to faulty materials of construction or poor construction. Two cases of failure of cast iron bushings were reported, and in an-

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other case, a solution line broke off at the tank connection and there was no shut-off valve.

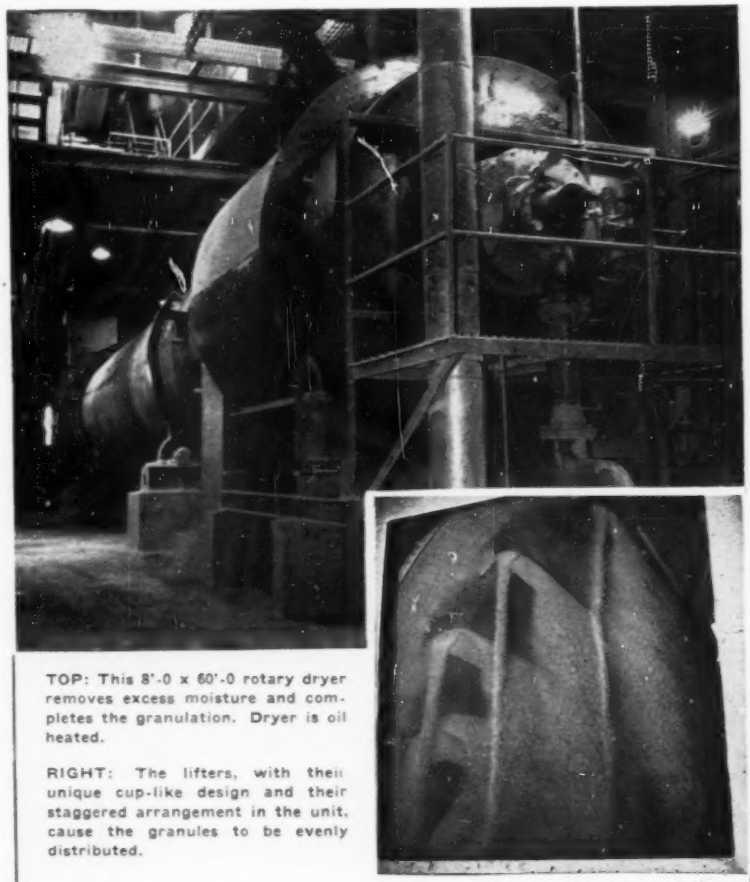
With regard to storage tanks, six tank failures were reported. Four of these were presumably from overpressuring, one was an outright corrosion failure and the last was a result of a nitrate explosion. Storage tanks are either atmospheric tanks or pressure tanks. If a storage tank is to be subjected to pressure, it must be protected by a safety valve. The setting of the safety valve must be no higher than the weakest part of the tank as found through calculations. There are three principal reasons why they fail: **1.** The safety valve has been frozen shut because of corrosive action or nitrate deposits. **2.** The metal has corroded considerably, reducing thickness. **3.** No safety valve at all but the pressure reducing regulator is used on the air line. With regard to the first reason, the letters from companies that had very few or no accidents all pointed out that they had a regular program of cleaning, inspecting and testing all safety valves and vacuum breakers. Secondly, as your tank loses metal thickness due to corrosion, the safety valve setting must be reduced. This means that you must look at your tanks to check for corrosion at least once a year. If you do not have a qualified person in your organization, hire a consultant. Thirdly, if any of you are operating without a safety valve and depending on a pressure reducing regulator, you are taking a whale of a chance, let alone violating the law.

There are tank failures due to the explosion of ammonium nitrate. In every case, the pattern was identical; attempt to repair vessels and lines by welding detonated dry ammonium nitrate that had salted out from ammonium nitrate-bearing solutions. Always use pipe cutters or hack-saws to cut into a nitrate line! Quoting from another letter: "Burning off solutions lines is a matter of deep concern to us. We just recently experienced an explosion of ammonium nitrate in a solution line caused by a mechanic burning off a bracket holding the line in the mixer. The torch was not applied to the line itself, but the heat traveled from the bracket to the pipe, raising the temperature of the ammonium nitrate in the line to the point of explosion."

On the subject of explosions, and again quoting from a letter: "One cause of explosion and ensuing fire from the handling of ammonia, which I have never seen stressed much but have seen occur, is where a dead air space can accumulate fumes. This is particularly dangerous where ammonia, either as anhydrous or solutions, is being handled inside an old mill type building. Such buildings usually have corners with dead air space where ammonia fumes can accumulate and a resultant explosion or fire can occur." The writer of this letter had seen two disastrous explosions as a result of ignition of ammonia fumes. The answer is obviously to adequately ventilate before welding; both outside and inside the metal being welded.

Mr. Page recommends these "Three Keys to Safety:" **1.** Pause and study the job at hand. **2.** Recognize the hazards associated with it. **3.** Take action that will avoid or overcome these hazards.

In closing, be cautious that we can not expect safe practices in our plant operation if management has not given their due share to safe tools, sufficient safety equipment, inspection of equipment to determine its condition and last, safety meetings and instruction. If management shows any indication of turning its back on safety, the work-



TOP: This 8'-0 x 60'-0 rotary dryer removes excess moisture and completes the granulation. Dryer is oil heated.

RIGHT: The lifters, with their unique cup-like design and their staggered arrangement in the unit, cause the granules to be evenly distributed.

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er has literally had the rug pulled from under him. Management can never expect the worker to carry most of the responsibility for safety.

The next day's session began with a luncheon at noon and featured a talk by **Arthur C. Studt, Manager of Training & Education, The Hotpoint Co.,** Chicago, on Brainstorming for Safety. Mr. Studt said that real creative thinking begins when your back is to the wall and you must do something different to solve a problem. "Brainstorming" to find a solution, is a sort of crash program meeting for developing ideas, none of which are too small, silly, good or bad as one thought leads to another, and nearly always lead to several good, workable ideas. A brainstorming meeting enables you to come up with enough different, usable solutions to produce three or four workable ones to solve a given problem.

The afternoon program consisted of the showing of a safety film produced by U. S. Steel and a panel discussion on a series of plant accident case histories. J. Lauren Shopen, Safety Director, Consumers Coop. Assn., was discussion leader and moderator, and participants were: Mike C. Ellison, Protection Supvr., Mississippi Chemical Corp., Yazoo City, Miss.; C. S. Griffith, Supt., Virginia-Carolina Chem. Corp., Cincinnati; John S. Mark, Production Mgr., Farm Bureau Coop. Assn., Columbus, Ohio; Stratton M. McCargo, Personnel Supvr., G.L.F. Soil Building Service, Ithaca, N. Y.; Gaither T. Newnam, Mgr., Insurance Dept., Smith-Douglass Co., Inc., Norfolk, Va.; A. I. Raney, Safety Dir., Phillips Chemical Co., Bartlesville, Okla.; Grayson B. Morris, Southern States Coop., Inc., Richmond, and W. A. Stone, Supt., Wilson & Toomer Fertilizer Co., Jacksonville, Fla.

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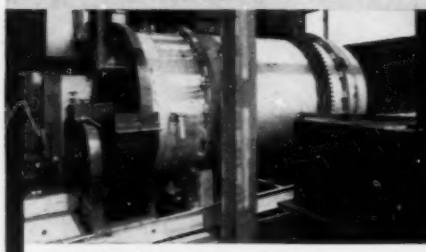

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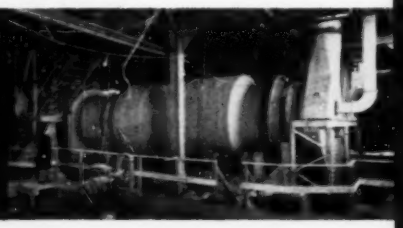

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Safety Executive Committee Meets; Committees Named

On October 22nd, the Executive Committee of the Fertilizer Section met, at which time the By-Laws for the Section were reviewed and changed to better accomplish the purpose of the Section.

The present objectives of the Fertilizer Section, as presented by the Chairman, are: **1.** To increase membership; **2.** Improve means of communication.

The General Chairman of the Section appointed chairman of various committees as follows: **Engineering:** John Mark, Farm Bureau Coop. Assn., Columbus, Ohio; **Nominating:** George Dietz, Fertilizer Manufacturing Coop., Baltimore, Md.; **Membership and By-Laws:** C. S. Griffith, Virginia-Carolina Chemical Co., Cincinnati, Ohio; **Insurance and Legal:** Edward Burroughs, F. S. Royster Guano Co., Norfolk, Va.; **Statistics:** Wayne High, The Baugh Chemical Co., Baltimore; **Public Relations:** Stratton McCargo, G.L.F. Soil Building Service, Ithaca, N. Y.

The next meeting of the Executive Committee was set to be held Feb. 6, at 9:00 a.m., at the Heart of Atlanta Motel, Atlanta, Ga.

Smog Plant Damage Called Curable

The use of metals in filters can stop smog plant damage according to biologist Hugh T. Freebairn, University of California. He reports that the damage is caused by an oxidizing agent and that this can be removed from the air by the use of such metals as steel, magnesium and zinc in filters. No mention is made of how such filters are to be applied to the problem, and California readers will want to contact the good proponent of the idea.

Architect's rendering of the new Bagpak plant in Litchfield, Ill.

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MONSANTO ANNOUNCES "LION E-2" A DUST-FREE, NON-CAKING PRODUCT

A new type of ammonium nitrate fertilizer that is dust free and will not cake during storage has been announced by Monsanto Chemical Company's inorganic chemicals division.

James E. Crawford Jr., director of marketing for the division, said that the new product, which has been named "Lion E-2," offers many advantages, yet sells for the same price as ordinary ammonium nitrate fertilizer.

"It can be stored indefinitely," Mr. Crawford said. "It can be stacked high without bottom bags caking, and its higher density takes 20 per cent less space in storage and in farm machinery." The new product remains free-flowing even under most unfavorable conditions.

In addition to being the first truly non-caking and non-dusting ammonium nitrate fertilizer, the product has the highest density of any prilled ammonium nitrate fertilizer now on the market, Mr. Crawford said. It has a harder prill, greater prill uniformity, is constant free-flowing regardless of temperature, pressure or humidity fluctuations," and contains maximum nitrogen content.

Experiments in Monsanto's mixed fertilizer pilot plant have shown that the new product, when used in the manufacture of mixed fertilizers of a high nitrogen to P_2O_5 ratio, imparts its prill hardness and non-caking characteristics to the final product.

Other extensive tests covering a period of nearly a year for both the physical and chemical properties of the new product, as well as its agronomical acceptability, were carried out by Monsanto in field and laboratory before announcing E-2.

E-2 does not cake even when exposed to pressures of 600 pounds per square inch. To exert pressures of 600 pounds per square inch on a 100-pound bag of fertilizer it would be necessary to stack 3,672 other 100-pound bags on top of it!

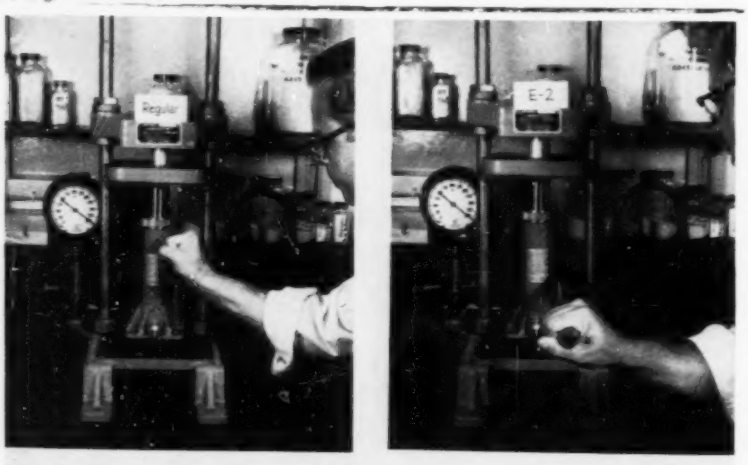
In addition to the pressure tests, E-2 was subjected to continuous heat cycling tests. These tests automatically cycled temperatures from 70° to 100° F. three times each day. E-2 was subjected to these tests continuously for more than 10 months without caking, expanding or dusting. This is equivalent to storage for more than 930 consecutive days in a hot summer climate.

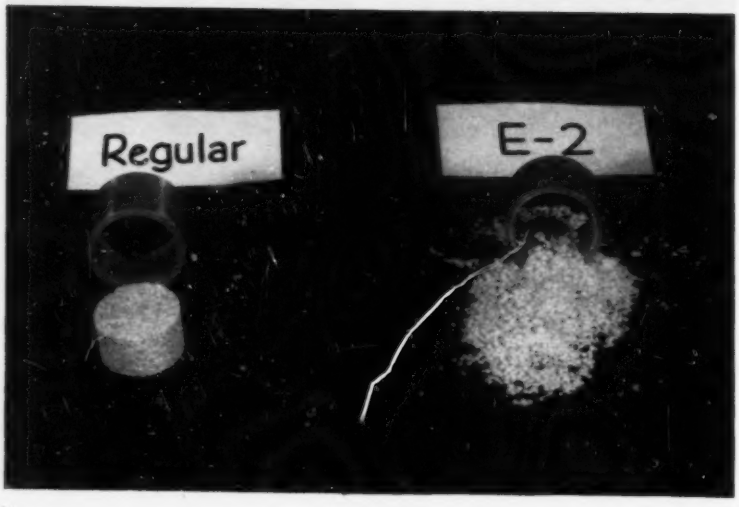
The new prill hardness is 50 per cent harder than ordinary ammonium nitrate fertilizer prills. The density, hardness and uniformity of the prills make it an ideal form of fertilizer for aerial application, yet the new product is readily water soluble and is highly suitable for irrigation fertilization.

The new product's high density also offers storage advantages. Pound for pound, E-2 requires 20 per cent less storage space than regular prilled ammonium nitrate fertilizer.

Monsanto is now manufacturing the new E-2 fertilizer, patents on which have been applied for, at its Luling, La., and El Dorado, Ark., nitrogen plants. It is available in both polyethylene and polyethylene-lined multi-wall paper bags.

Lion E-2 and regular ammonium nitrate undergo caking tests. Upper photographs: fertilizers are subjected to 600 pounds of pressure per square inch in research laboratory pressure cylinders (note pressure gauges); lower photograph: regular ammonium nitrate prills, some broken and crushed (left), come out of cylinder as solid cake while E-2 prills (right) remain uniform, free-flowing.





Union Bag-Camp Sparks Davison Davco 3-G Bag

Is it possible to increase the merchandising appeal of a package and, at the same time, reduce its cost without changing its construction? Yes, says W. R. Grace & Company, Davison Chemical division, Baltimore, Maryland. They report that they effected both results by means of a package redesign.

Previously the company packaged its "Davco 3-G Granulated Fertilizer" in a multiwall bag printed black and green on an outer sheet of orange paper. In redesigning the bag, Union Bag-Camp Paper Corporation eliminated the expensive outer sheet of orange paper and printed the bag orange and black on a kraft colored outer sheet. Also by using a horizontal design there is more display area as well as stronger trademark and product identification.

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CFA HOLDS 35th ANNUAL CONVENTION

Five hundred persons who attended the 35th Annual Convention of the California Fertilizer Association roundly applauded Ronald Reagan, screen and television star when he dramatically defended the American free enterprise system.

The Convention was held at the Ambassador Hotel, Los Angeles, on November 9, 10 and 11. In addition to the business program, there were competitive events for the men and for the ladies.

During the Association's annual business meeting President Howard H. Hawkins, Golden State Plant Food Company, Glendora; and M. M. Stockman, The Mountain Copper Company, Ltd., San Francisco were re-elected to new three year terms on the Board. James F. Sloan of J. F. Sloan Company, Salinas, was elected to fill out a term on the Board which will expire in 1959. Two new Directors were elected to three year terms which will expire in 1961: L. R. Hamilton of California Spray-Chemical Corporation, Richmond; and C. E. McFaddin, Imperial NH_3 Service Company, El Centro. Holdover Directors are Jack Baker, General Manager, Bandini Fertilizer Company, Los Angeles; Lowell W. Berry, President, The Best Fertilizers Company, Oakland and Lathrop; Fred R. Bryant, Brown and Bryant, Shafter; Demont W. Galbraith, President, Agriform of Northern California, Inc., Woodland; Earl R. Mog, Owner, Growers Fertilizer Company, Stockton; and John N. Williams, President, General Fertilizer & Supply Company, Chula Vista.

The 1959 Board of Directors, at its organization meeting, elected these officers to serve the Association until the 1959 Convention; President, Howard H. Hawkins; Vice President, M. M. Stockman; Secretary, James F. Sloan; Treasurer, Fred R. Bryant; and General Manager, Sidney H. Bierly.

Dr. Russell Coleman, National Plant Food Institute, spoke at the business meeting on the subject "Your Future is in the Bag." Among other things he said, "Fewer people will be living on the farm. Only 12% of our people now live on farms. By 1975 this number will probably be down to 5%; 50% of farm youths will continue to leave the farm thus giving industry a constant supply of labor and making it possible for our nation to continue its industrial economic growth; . . . Productivity per farm worker will continue to increase faster than with industrial workers; Farmers will demand more bargaining power for their products. Farmers now earn only 45% as much per hour as do workers in industry; . . . Fertilizer consumption will double by 1975. Without commercial fertilizer the above changes would not be possible."

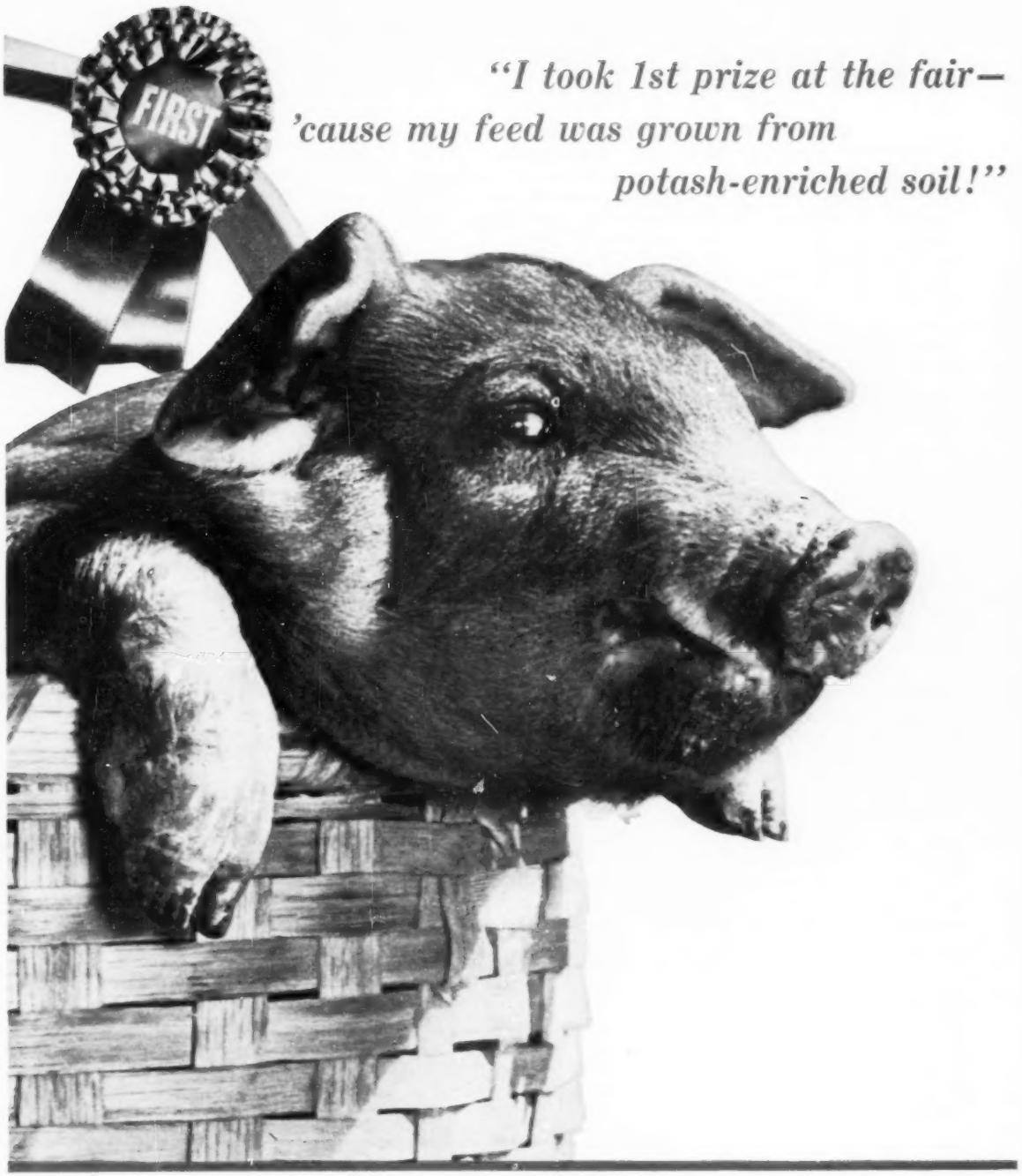
L. C. (Roy) Kennedy, Credit Manager, California Spray-Chemical Corporation, Richmond, addressed the Convention on "Credit—The Lubricant of Commerce—or—Don't Foul Your Spark Plugs." He said that "business is good when we can make a profit and collect that profit. . . . If we get right down to grips with the subject, there is really only one reason for credit, and that is to help sell goods or services. Wisely used, credit can help."

He said that liberalization of credit policy is no substitute for sales effort, and in the long run, a loose credit policy tends to bring about a stagnation of sales. He pointed out that the credit policies of the fertilizer industry seem to run in cycles, and that he recalled a period of generally loose credit which brought it to such a pass that it was forced to drastic measures, and withdrew all credit terms for a time. He said that it took ten years to get this situation straightened out. There are now signs of trouble again beginning to appear with increasing frequency.

President Hawkins opened the meeting with a welcome to the large attendance of delegates and ladies. General Manager Sidney H. Bierly reported that the outlook for the general economy was good, and that fertilizer use in California should continue to increase during 1959. He cited the CFA public education program and the Soil Improvement Committee program of cooperation with official agriculture as being important factors in this forecast. He urged the industry to continue in its efforts to up-grade its salesmen and dealers knowledge, and told of CFA cooperation in sponsorship of short courses to this end.

Malcolm F. Rice, SIC Agronomist, reported on the good progress made during 1958 on SIC projects. Among these were the grant-in-aid to the University of California, currently on bean variety fertilization and diagnostic techniques; the Citrus Station lysimeter program; donation of a new tractor on a rental basis to the University for use in cereal grain work; donation of a Servis Pasture Renovator to the University for range work; donation of fertilizer materials to the University for forest soil studies, and for the cereal grain project; SIC cosponsorship, with the NPFI, of the California Forest Soils Fertilization Conference in Sonora on February 28, and of the Western Range Fertilization Conference in Redding on October 27; the Sixth Annual California Fertilizer Conference at Calpoly, San Luis Obispo, on April 15 and 16; a meeting of fertilizer people with Citrus Experiment Station personnel on October 15 to eliminate confusion in citrus fertilization recommendations; SIC visual aids, including the Handbook, the Range Fertilization booklet, A Balanced Diet for Plants, the film, "California Grows With Fertilizer," the Essay Contest, and Cal-poly scholarships.

The panel discussion included audience participation. Moderator was Dr. Daniel G. Aldrich, Jr., Chairman, Department of Soils and Plant Nutrition, University of California, Davis and Berkeley. Panel members and their subjects were Roy Kennedy, "Sound Credit Planning For The Fertilizer Industry"; J. Earl Coke, Vice President, Bank of America, San Francisco, "Prospects For Expanded Farmer Use of Existing Credit Facilities"; R. L. Luckhardt, Supervisor, Agricultural Technical Service, Collier Carbon and Chemical Corporation, Los Angeles, "Fertilizer Industry Technology Trends"; W. L. Dixon, Jr., President, Western States Chemical Corporation, San Francisco, "Trends in Granular Material Production and Use"; D. W. Galbraith, "Development of Ammonia Marketing Trends"; Ralph S. Waltz, Vice President and Manager, Agricultural Department, Wilson & Geo. Meyer & Co., San Francisco, "Wholesale Distribution Trends"; and James F. Sloan, "Retail Distribution Trends".



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changes

Chemetron to Operate New Plant for N.C.I.

Announcement by J. E. Totman, president of Northern Chemical Industries states that N.C.I. has contracted with Chemetron Corp. (formerly National Cylinder Gas Corp.) for the latter's chemical division to operate its new Ammonia plant and related facilities at Searsport, Maine under a five-year lease. N.C.I. will act as sole distributor of the production. Northern Chemical will continue to operate independently its original facilities producing superphosphate, sulphuric acid, liquid alum, sulphate of ammonia and sodium silicofluoride.

The Anhydrous Ammonia plant is one of the first in the United States to manufacture Ammonia using Bunker "C" Oil as the source of hydrogen under the Texaco-Hydrocarbon patented process. The plant was designed for 125 tons per day ammonia capacity with a 60 ton per day nitric acid unit. The latter has been in full production for the past two years. Production of ammonia is now underway at close to the rated capacity.

The Chemical Division is taking over most of the original N.C.I. operating personnel. Fred L. Litty, vice president & general manager of N.C.I. will act as liaison officer between Chemetron and N.C.I. as well as continue to heap up the local N.C.I. original operations. George Odom, formerly assistant general manager of N.C.I., will continue in similar capacity with Chemetron. Donald Fangmeyer, general sales manager of N.C.I., will be in charge of sales of all products produced at Searsport.

International Moves Bagpak Research

Market research and product development operations of International Paper Company's Bagpak Division have been shifted from Camden, Arkansas, to the company's New York headquarters. W. L. Shoemaker, with International since 1951, has been named manager of these activities.

Hooker Moves Executive Sales Offices

The executive sales office of the phosphorus division of Hooker Chemical has been moved to the Lincoln Building, 60 East 42nd St., New York 17, N.Y., where it is located on the thirtieth floor with Hooker's other New York offices. The announcement was made in New York by John B. Sutliffe, general sales manager, Phosphorus Division. Corporate sales headquarters remain in Niagara Falls, N.Y.

The Division's office was formerly located at 114 East 40th St. which had been the executive headquarters of the former Shea Chemical Corporation, now Hooker's Phosphorus Division, prior to Shea's consolidation with Hooker last May.

Colorado

Colorado International Corp., 1421 16th St., Denver, has just opened a sales office for its agricultural chemicals and chemical processing plants, at 5321 Dahlia St. in Adams County, Colo.

Association Briefs

Pacific Northwest Plant Food Association, meeting late in October, elected Ray Whitcomb, Link Distributing, president; Karl Baur, Pacific Cooperatives, vice-president; Henning Waltersdorph, Magnolia Fertilizer, Treasurer. 234 were in attendance. The next convention, by precedent, goes to Washington.

* * *

Western Range Fertilization Conference was held October 27 at Reading, Cal., co-sponsored by NPFI and the Soil Improvement Committee, CFA, plus the cooperation of the California Chapter, American Society of Range Management. The sessions ran from 11:30 in the morning until 9 that night. CFA's president, Howard H. Hawkins, keynoted.

* * *

Texas Anhydrous Ammonia Assn. met in Lubbock October 27 and elected F. W. "Chief" Jones president. Marion Badger is vice-president. Jimmy Allred Hereford is secretary-treasurer. About 150 attended.

* * *

Agricultural Ammonia Institute will meet December 3-5 in Chicago at the same time as the nation's major agricultural exposition, which includes livestock and hay and grain. President Paul J. Duesterhaus will preside over the AAI sessions, and headline speakers are lined up for a constructive program.

* * *

Arkansas Plant Food Conference, eighth of such annual meetings, is scheduled for December 4-5 at the University of Arkansas. Featured will be the latest research results on cotton; pasture and forage fertilization.

* * *

Soil Science Society of North Carolina has set its meeting for January 27-28 at N. C. State College in Raleigh. W. H. White, N. C. State, will give you details on membership and the 1929 meeting schedule.

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—of This and That . . . . .

____Fortune magazine for Nov. carried a fascinating article about Virginia-Carolina's head man, Justin Potter. Circulated, too, is an equally fascinating picture showing Justin Potter with V-C's oldest and youngest stockholders, Perry E. Bradley and the infant son of R. C. Long, V-C's Secretary.

____Seen at the Annual Fall Auction at Keenland Track in Lexington, Ky., were Maurice Williams and Press Sale of Cooperative Fertilizer Service of Richmond. The first colt went for $9,00.

____TV's Arthur Godfrey is in the fertilizer business (it was news to us). His partner in the enterprise is Mrs. Fran Fitzpatrick White, who is president of Fiestar, a New Jersey-based garden fertilizer producing firm with annual sales exceeding $1,000,000. Mrs. White started her career modeling suits and coats; then became a buyer for the New York office of Carson, Pirie, Scott & Co., Chicago. Says Mrs. White: "One nice thing about fertilizer is that it doesn't go out of style."

____And across the continent a couple of gals—Betty Barnes and Martha Parks—in Hermosa Beach, Calif., have parlayed $500 (borrowed 9 years ago) into a fertilizer business that grosses annually around one and a quarter million dollars.

____In Spencer Chemical's fall issue of Today's Fertilizer Dealer, dealer Wendell Turner of Villa Grove, Ill., is featured. Three years ago Wendell acquired an old C and EI roundhouse for storage. This is mentioned in the story and it's a good story with good pictures. But the one that got a laugh was the one showing Wendell and Spencer's Dunc Kincheloe inspecting bulk mixed goods. The tarp behind Wendell is black polyethylene film used to keep the material clean. (The roundhouse rafters are loaded with sparrows and Wendell says he's selling granulated fertilizers, not guano).

____Heard a prediction lately that the day will come when commercial farms will have staff agronomists to coordinate the current findings of all sorts of scientists, and apply them to making the farm yield better and pay better. He will naturally be expected to tailor fertilizer use to the soil. It may change fertilizer distribution methods and formulas. It certainly will be good for the industry—because such an agronomist will not need to be sold on plant food at the best-paying levels.

____Imagine flying 15,000,000 passenger miles to show a new line of farm and industrial equipment to dealers. It will take an armada of big planes from four major airlines to do the job. The event is J. I. Case's world premiere of their new lines. They will fly 5,000 dealers from all over the world to Nassau before they are through.

This amazing airlift started middle of last month and flew a thousand people in and out of Nassau every five days, until all have been carried.

To our industry, Case is best known, of course, for their tractor shovels.

____The technique that in other industries is described as Tote Boxes or Flow Bins is now being applied to fertilizer. Wilson and George Meyer and Co., working in collaboration with Western Phosphates and Stauffer are offering fertilizer at the railroad siding in bulk containers. These range from pretty large tanks to small 1½ ton bins the farmer can carry on his own truck.

____There's a science show on KRON-TV, San Francisco. Recently Dr. Richard Bahme, NPFI's regional director in those parts appeared on the show with a 30-minute presentation, prepared by NPFI. It included scale models of various fertilizer sources, and Dr. Bahme discussed the role fertilizer plays in improving farming efficiency with Dr. Earl S. Herald who hosts the show.

____Sitting in Chicago recently, a thousand packaging men watched stretchable paper being made a thousand miles away in Charleston, S. C. This was, of course, a closed-circuit TV deal set up by West Virginia Pulp and Paper to show how Clupak is made, and why. As it is produced on $25,000,000 worth of equipment, and as it does things paper for packaging never did before, the packakging boys were doubly impressed. Clupak has been on the market almost a year now, and is considered the most important development among paper products in this century.

TVA Drops 48%, Plans Higher Superphosphate

TVA has discontinued the manufacture of concentrated superphosphate fertilizer containing 48 per cent plant nutrient, and is engaged in perfecting a process for the manufacture of a superphosphate of still higher concentration.

Experimental production has already started on a high-analysis superphosphate containing about 54 per cent plant nutrient. This has been made possible through development by TVA of a superphosphoris acid, 40 per cent more concentrated than acid ordinarily used to make concentrated superphosphate.

When TVA started its fertilizer research and experimental production program in 1934, private industry was producing only about 70,000 tons of concentrated superphosphate with an analysis of 42 to 45 per cent. In little more than two decades a widespread and well-established commercial market for the material has been created. Last year private industry produced more than a million and a half tons.

Concentrated superphosphate was the backbone of the TVA-extension service test-demonstration program during the early years.

Baltimore Accepts Nitrate Reports

The City Council of Baltimore has tentatively accepted the recommendations of its Harbor Committee on the subject of ammonium nitrate handling through the Port. This has been a subject of controversy for some time because the original rulings prohibited all types of ammonium nitrates.

Conferences with the industry have brought about the exemption of fertilizer ammonium nitrate which the report suggests may be handled in the normal course of business. Other nitrates are admitted under special permits from the harbor engineer.

Waste Control Brings Good Will

The phosphate industry in Florida's Polk and East Hillsborough counties will have an estimated $7 million invested in modern waste control equipment by the middle of 1959, an industry representative told the National Conference on Air Pollution November 19.

Howard F. Roderick, vice president in charge of the phosphate chemicals division of International

Minerals & Chemical Corporation, said that operation of such equipment represents additional heavy spending by the industry and amounts to $250,000 annually for his own company.

Seven major phosphate producers in the area recently joined together in an industry research program on the air pollution problem, Mr. Roderick said.

"This program in the last six months has resulted in better understanding of the problem than has ever existed in the area," he said, "and the industry recognizes that it is receiving an expression of public confidence and good will which it must respect."

The industry representative explained that an air pollution study involves almost unbelievably complex and painstaking research to determine the contributing factors, without which a solution is impossible.

Resources Research Inc., of Washington, has been retained to conduct expert and impartial scientific research, Mr. Roderick said.

obituaries

H. F. Boyer, owner, Boyer Fertilizer Service Mfg., Watsonville, California, died October 8.

Walter Howe, 80, who had been associated with French Potash and Import Co. since its formation died November 3.

Edward A. Sikorski, 57, chief chemist of General Chemical division of Allied Chemical died of a heart attack in his office, October 29.

Joseph L. Sturtevant, 84, treasurer Sturtevant Mill Company, and former president and board chairman, died in Boston after a long illness on October 16.

Elliot K. Ludington, Sr., Chairman of the Board of Chase Bag Co., died of a heart attack on October 8 at St. Clare's Hospital in New York.

Dr. Harold Mowry, 64, former director of the University of Florida AES and more recently consulting director to the Minister of Agriculture and chief of the University's cooperative mission to Costa Rica, died November 12 at University of Florida Teaching Hospital from a heart attack.

Howard R. Tolley, 59, chief of USDA's Bureau of Agricultural Economics from 1938 to 1946, then with UN's F.A.O., the Ford Foundation, and in 1954 as adviser to the Pakistan Planning Board, died September 18 at home in Alexandria, Va.

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